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ABSTRACT

This lesson plan for the first grade uses information on transportation, with sub-themes of communities and careers, to provide history/social science education for limited-English-proficient (LEP) students in San Diego, California. Activities and materials from the State scholastic science kit are also used, as are songs, poems, music, and games. Instructional components include second language development, primary language instruction, specially designed academic instruction in second language, cross-cultural/self-esteem building, and parent/community involvement. The time span of the lesson plan is 3-5 weeks. Language levels include pre- and early production, speech emergence, and intermediate fluency. (NAV)

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ED 389 203

THEME: TRANSPORTATION WITH SUB-THEMES COMMUNITIES AND CAREERS

GRADE: 1

CONTENT AREA: LANGUAGE ARTS/MATHEMATICS/SOCIAL STUDIES/SCIENCE/MUSIC/ART/P.E./DRAMA

TIME LENGTH: THREE TO FIVE WEEKS (Each period marked "day" is the time interval required to complete the concepts presented.

LANGUAGE LEVELS: PRE-PRODUCTION, EARLY PRODUCTION, SPEECH EMERGENCE, INTERMEDIATE FLUENCY

INSTRUCTIONAL COMPONENTS: ENGLISH LANGUAGE DEVELOPMENT (ELD), PRIMARY LANGUAGE INSTRUCTION, SPECIALLY DESIGNED ACADEMIC INSTRUCTION IN ENGLISH (SDAIE), CROSS CULTURAL-SELF ESTEEM, PARENT/COMMUNITY INVOLVEMENT

1. THEME AND RATIONALE

This unit on transportation will include related sections on communities and careers and satisfies the requirements of the state framework for history/social science of the state of California. It also will present activities and use materials from the Scholastic science kit a state approved science adoption. In addition to following the guidelines of the state framework, this unit follows federal LEP guidelines for teaching English language learners ensuring that all students have equal access to the curriculum.

Generic ELD lessons are provided with accompanying categorized vocabulary lists. The lists are content related and are listed along with each group of lessons. The main concepts of each lesson are presented by the primary language instructor and are provided for all students regardless of their level of language proficiency in the second language. All eight subjects are covered in the primary language so as to support the students' learning in their SDAIE courses. Because students were taught in their primary language, these SDAIE lessons are the same for each language proficiency level and are conducted in heterogeneous groups. In this way, the more proficient students can assist the less proficient students. The cross-cultural component is presented through a list of ideas which may

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be used throughout the unit so as to promote student thinking and consideration of other cultures. The goals of self-esteem and high expectations for all students are portrayed through a list of vocabulary words and activities which promote these concepts.

Unit Goals and Instructional Objectives

1. Students will understand how people need to move living and nonliving things from place to place and have invented ways to do this.

A. Through hands on activities, students will demonstrate their knowledge of energy and how people use it to move things via land, water and air.

B. Using charts, class mural and/or collage, students will be able to identify, retell, or write a paragraph about why we need to move things and the what would happen if we could not.

C. Given a talking chart, students will be able to show what new problems transportation problems have caused that people are trying to solve.

2. Students will understand how people live and work together in a community.

A. Using pictures students will be able to point out differences and similarities between houses, condos and duplexes.

B. Using a talking chart, students will be able to point out differences and similarities between the country and the city.

C. Using pictures of people performing different careers, students will discuss and participate in activities which will help them explore different career possibilities.

3. Students and parents will become involved in a parent community involvement program.

A. Fund raising for local cause

B. Parents will help develop classroom communication system to help all parents understand and participate, in the unit development.

CROSS-CULTURAL IDEAS/ACTIVITIES

1. Student generated bulletin boards showing transportation, communities, careers from other cultures using magazines such as National Geographic.

2. Language charts in different languages, street signs from communities of other cultures.

3. Have guest speaker/parent come in and talk about community they came from.

4. Present style of dress /food from communities of other cultures.

5. Have field trip to ethnic community

6. Discuss schools in other cultures.

7. Have student bring something related to theme from their culture to share.

8. Discuss how differences in appearance, economic status, and speech can lead to discrimination.

9. Classroom library must reflect cultural diversity related to theme.

10. Display maps, flags, coins, and stamps of other countries.

HOMEWORK

Day 1
Students will keep a journal of all the places they visited, how they got there and what they saw for one week.

Day 2
Students will observe the sky during this time interval, the types of planes they see and will keep a journal of their sightings, including the weather and a description of the cloud formations.

Day 3
During this time interval, students will take turns checking out one of the various books about boats from the classroom library and will write a book report about the things they learned.

Day 4
Students will draw a map of their neighborhood which will include the street, kinds of houses, stores, and other structures.

Day 5
Picking the career of their choice, students will interview parents and friends and go to public library in order to find out what they must do to prepare themselves for this particular career.

Previous Content Learned

Units and related vocabulary thus far presented have been on the human body, weather, animal characteristics, animal classification, farm animals, plants, and space.

Outline of the Content

A. Land Travel
B. Air Travel
C. Water Travel
D. Neighborhoods
E. Country/City /Careers
F. Music/Poetry : El viejo autobus, My Little Red Fiat, Tree House, Mi aeroplano, The Community Helper Song.
G. Language Arts:
Let's Discover: Land Travel, Raintree Publisher
Things on Wheels, Roger Priddy
Make it a Move, Julian Rowe and Molly Perham
The ABC of Cars, Trucks and Machines, Adelaide Hall
Flying, Gail Gibbons
Fly!: A Brief History of Flight Illustrated, Barry Moser
Harbor, Donald Crews
Boat Book, Gail Gibbons
A House is a House for Me, Mary Ann Hobby
Building a House, Byron Barton
The World of Art Cities: Through the Eyes of Artists, Wendy & Jack Richardson
City Mouse, Country Mouse
H. Math: Graphs, Estimating, Measurement, Weight, Problem Solving, Addition/Subtraction, Venn Diagram

Description and Assessment

Students will keep a personal journal describing the various activities in which they participate through their writings and drawings during the transportation unit. During activities, anecdotal records will be kept of teacher observations and students will have opportunity to share with teacher or class observations and discoveries they have made demonstrating their abilities to be self-directed, open-minded, sensitive, and hopeful.

ELD ACTIVITIES FOR TEACHING CONTENT RELATED VOCABULARY

Vocabulary Sets

Using vocabulary words from the theme, brainstorm with students to create category headings. This then becomes a "talking chart" and students can create sentences using words from the various categories. Sentences can be set to simple tunes, i.e., "The Farmer in the Dell, "Twinkle, Twinkle", etc.

Theme Booklets

1. Distribute ten sheets of 81/2" by 11" paper and one piece of 12" construction paper to each student.

2. Have students fold the construction paper in half to make a folder.

3. Have students place the ten sheets of paper inside the folder and staple it to make theme book.

4. Have students number the pages in the lower or upper right corner from 1 to 10.

5. Circulate, giving assistance as needed. Take this opportunity to review vocabulary.

Using drawings, magazine pictures, or actual items, if applicable, related to theme, students will cut and paste them on the pages of their booklet and label.

Theme Music

New records and songs should be introduced carefully to ensure optimum student comprehension, participation, and enjoyment.

1. Teach the vocabulary from the song first using visuals such as chalkboard drawings, art prints, magazine pictures, etc. and/or physical action.
2. Next, ask a question which a phrase of the song answers. Then sing the

phrase. Students must listen to the phrase to be able to answer the question. Repeat as appropriate until entire song presented.
3. Have students listen to entire song again. Then mark on board lines for each word of a phrase from the song and number each space. Then sing the phrase having students listen for a targeted word. Students then try to determine which space the word fits in by calling out the number. Repeat as appropriate.
4. After the listening experience, sing the words of the song, phrase by phrase, and have students repeat them after you. Check to make sure students understand the general theme of the song.

5. Repeat the complete song and encourage students to sing along.

Music Index Card or Sentence Strip Game

Put a phrase from song on an index card or sentence strips. Pass out to students, individually or in groups. Then individual students or groups put song in order.

Read the poem to the students. Discuss any new vocabulary presented. Read each stanza. Have students repeat each stanza after you. Emphasize the rhythm and intonation of the poem.

Encourage student communication at one of the following levels:

A. Minimal (pre-production/early production) - Have students name/point to specific vocabulary they recognized in the poem.
B. Expanded (speech emergence) - Have students tell what the poem is about.
C. More complex (intermediate fluency) - Have students tell why they liked/disliked the poem.

ABC Order

Students work together placing theme vocabulary words in ABC order.

Index Card Games

Make index cards with a picture reference of vocabulary word/words being studied. Write questions on card which students must answer. Pass

around cards. Students sit in circle, then taking turns, they display card and try to answer questions.

Use questions like: Where, time, smells, describe, color, shape, etc.

Matching Picture Cards to Word Cards

Picture and word cards are passed out to all students. Picture card is placed in right hand and word card in left hand. Students show no one their picture cards. Students then must describe their pictures. Then person who has that word takes the hand of the student who has the picture card. In the end, couples are holding hands.

Pronunciation Relay

A stack of index picture/word cards is placed on table on each side. There are two teams. One person on a team reads card. Another person from team writes what he heard on board. When both teams have finished, see who has the most correct words on board.

Scroopies

Each student has three answer cards: YES, NO, DEPENDS

Two students come forward. On index cards, the following types of questions are written in this format: If_____would you_____. (One student asks the other a question. (conditional practice) The class tries to guess how he will answer by holding up one of their answer cards.

Picture Card Activity

Give a picture card to one student. Then give the same picture with part of it missing to another student. First student without showing card describes his picture and second student must try to draw missing part.

The $10,000 Pyramid

Five words/pictures are on a card from different categories. One person describes a word, other person tries to guess it.

Word Searches

Self-explanatory

Order Up

Students sequence study prints (pictures of a story) The object is for students to cooperate in sequencing the study prints without teacher assistance. To make the task more challenging, repeat it with a time limit.

Language Experience Story

Given pictures of a story, discuss with students what is happening in each picture. After discussion, ask someone to suggest a sentence that could go with each picture.

Helpful hints: Students are likely to contribute lengthy text for each page. Encourage students to summarize what is happening rather than telling all the occurrences and dialogue.

Do not transcribe ungrammatical statement. Repeat the statement to the group in its correct form, then write it. Use praise, subtlety, and tact so that students will not be afraid to contribute for fear of making errors.

More Practice:

Given a picture from story or other text, with targeted vocabulary words at bottling, students will find and circle the picture of the word indicated.

Art Prints Related to Theme

Describe to students the scenary in prints. Ask questions such as the following:

A. Minimal (pre-production/early production) - Point to _____ or what do you see in this picture?
B. Expanded (Speech emergence) - Describe the colors, people, activities, etc.

C. More Complex (intermediate fluency) - How are these two/three pictures alike/different? Which picture is your favorite? Why/Why not?

More Games

Picture dominoes
Bingo
Memory
Spinner games using spinners with the vocabulary pictures/words on them.

VOCABULARY

DAY 1

Car Parts

wheel
windshield
tire
flat tire
engine
steam engine

Things with Wheels

horse and carriage
wagon
car
bus
truck
train
tow truck
machines
cart

Roads

highways
freeways
ramp
surface

Places

restaurant

Things Cars Need

gas
oil
check the oil

Comparing Objects

heavy
light
ruler
measure
more
stretches

Moving

pushing
lifting
flying
rolling
inertia
pulling
swimming
swinging
resistance
stationary
motion
change in motion
moving object

Directions

far right
far left
next to
between
second
around

Activity Directions

attach
mark
fold
slit

Activity Materials

paper clip
rubber band
string
wax paper
sandpaper

DAY 2 AIR TRAVEL

Things That Fly

hot air balloon
blimp
glider
hang glider
helicopter
rocket
jet
satellite
shuttle

People

inventor
Sir George Cayley
The Wright Brothers
Amelia Earhart
Charles Lindbergh
John Glenn
Neil Armstrong

Things on Planes

engine
propeller
cockpit
wings
fuel tanks
baggage area
rotor
parachute

Jobs for Planes

crop dusting
advertising
freight carrier
fire fighting
traffic reporting
rescue
transport

Paper plane and Flying Teacher Activities

paper clip
straw
bend forward
bend back
drop
spin
float

Comparing
highest
farthest
inches

DAY 3 WATER TRAVEL

Things that Float

boats
ships
ferryboat
tanker
tugboat
barge
freighter
police boat
fireboat
kayak
rowboat
canoe
sailboat
cabin cruiser
speedboat
aircraft carrier
destroyer
submarines

How Boats Go

sail
paddle
oars
engine
propeller
wind
blows gently
blows hard

Directions

away from you
toward
turn
opposite end

Transportation Problems/Solutions

pollution
carpools
traffic jams
public transportation
air quality
smog
smog device
smog check
birth defects
environment

Bodies of Water

bay
lake
ocean
sea
strait
harbor

DAY 4 NEIGHBORHOODS

Types of houses

condo
apartment
duplex
2-bedroom, 3-bedroom, etc.
tree house
cozy
neat
street
high
free

Inside Houses

living room
bathroom
bedroom
garage
dining room

Community

neighborhood
map
atlas
street
sidewalks
city country

Comparisons

large
small
medium sized

Building a House

foundation
frame
roof
outside covering
shingles
stucco
plumbing
electrical
insulation
walls
ceiling
dry wall
windows
doors
accoustic material
paint
floor covering
hardware on doors/cabinets
light fixtures/electrical fixtures

Map Words

key
symbols
north
south
east
west
compass rose
legend

DAY 5 COUNTRY/CITY

Careers

scientist
mailman
nurse
banker
farmer
doctor
police
bus driver
salesman
fireman
teacher

Jobs

deliver mail
put out fires
teach
cure diseases
deliver babies
sell things
drive buses
fight crime
work in a bank
plant/harvest crops
invent things

Career Clothes

uniform
badge
hat
boots
skirt
jacket
suit
waterproof
smock
laboratory coat

DAY 1- Land Travel

LANGUAGE ARTS

Primary Language Instruction

Discuss concepts in Let's Discover: Land Travel. Raintree Publishers.
Poem: El Viejo Autobus

Specially Designed Academic Content in English

Read Things on Wheels by Roger Priddy. Have students develop vocabulary sets using vocabulary from the reading.

MATH

Primary Language Instruction

Explain the Train Station activity: Problem Solving (See attached lesson)

Specially Designed Academic Content in English

Do Train Station activity

SOCIAL STUDIES

Primary Language Instruction

Discuss the history of land travel from Let's Discover: Land Travel

Specially Designed Academic Content in English

Students will label chart using pictures to show the history of land travel from the use of animals to today . Use as talking vocabulary chart to report.

SCIENCE

Primary Language Instruction

Discuss concepts from Make It a Move by Julian Rowe and Molly Perham. (Describes in simple terms different ways of moving including pushing, lifting, pulling, swimming, flying, and rolling.

Specially Designed Academic Content in English

Students participate in centers: 1) Why Do We Need Seatbelts? 2) Which Objects Need More Energy To Move? 3) What Affects Motion? 4) Students gather several things from around room, then have to move them all together from point A to point B. They have to solve problem

MUSIC

Primary Language Instruction

Music: Discuss meaning of words to My Little Red Fiat through pantomime

Specially Designed Academic Instruction In English

Using Orff instrumental concepts chant then sing song using layering techniques. (See Orff teaching techniques)

DRAMA

Primary Language Instruction

Discuss concepts and vocabulary from The ABC of Cars, Trucks and Machines by Adelaide Holl. Students pantomime the concepts presented.

Specially Designed Academic Content in English

As The ABC of Cars, Trucks and Machines is read, students will take turns leading group in pantomime trying to predict what picture will come next. The student leader will then call on volunteers to say what the word is.

P.E.

Primary Language Instruction

Explain how to participate in Train Game.

Specially Designed Academic Content in English

Students play Train Game. A group of 5 students form a line and attach to each other touching shouiders. A leader is determined, then to music they march around as a "train" following and doing what the leader does. Using movement vocabulary, leader directs verbally using vocabulary from the various categories.

DAY 2-Air Travel

Language Arts

Primary Language Instruction

Present concepts from Flying by Gail Gibbons

Specially Designed Academic Content in English

List types of planes or jobs that planes do. Draw a plane and write "airplane" words around it (this could be a cooperative activity)

MATH

Primary Language Instruction

Make planes as instructed in How Do Wings Help Planes Fly? (See attached sheet) Measure off an area in feet going up and also across ground. Have contest to see who can fly plane the farthest and/or highest.

Specially Designed Academic Content in English

Using language from measuring and comparing, students will make a graph of the information from above activity

SOCIAL STUDIES

Primary Language Instruction

Present concepts from Fly!: A Brief History of Flight Illustrated. by Barry Moser. It highlights sixteen episodes in the development of aviation ranging from balloons to the space shuttle.

Specially Designed Academic Content in English

Students will draw a time line showing history of aviation using vocabulary and concepts in above book .

SCIENCE

Primary Language Instruction

Explain how to do activity called Welcome Back including scientific method. (see attached sheet)

Specially Designed Academic Content in English

Do above activity

MUSIC/DRAMA/ART

Primary Language Instruction

Use poem: Mi aeroplano. Have students go outside and watch airplanes to associate images in the sky (sun, clouds, rays, etc.) Students by group recite a stanza of poem then each group draws a large drawing describing their stanza. As poem is recited, students take turns pointing to appropriate part of drawings. Also using drawings, groups can put poem in order and recite.

Specially Designed Academic Content in English

Using same drawings, students invent an English sentence describing drawing, then dramatize and present.

P.E.

Primary Language Instruction

Parachute activities: Explain activity in classroom

Specially Designed Academic Instruction in English

Using parachute, class will do various parachute activities using the vocabulary of movement that has been learned thus far.

DAY 3-Water travel

LANGUAGE ARTS

Primary Language Instruction

Language Arts: Discuss concepts from Harbor by Donald Crews. Presents various kinds of boats which come and go in a busy harbor.

Specially Designed Academic Content in English

Using Boats by Byron Barton, write left side of each page on on e sentence strip and right side on another. Have the students match up the sentence parts.

MATH

Primary Language Instruction

Explain instruction to rolling dice game

Specially Designed Academic Instruction in English

Play rolling dice game reviewing vocabulary of transportation vehicles (See attached sheet)

SOCIAL STUDIES

Primary Language Instruction

Discuss how we can solve transportation problems. Cars, boats, and planes can cause problems such as traffic jams, pollution, and depletion of natural resources. Public transportation and carport can reduce some of the problems associated with transportation vehicles. See lesson 15 and 16. (Scholastic . Grade Science Kit)

Specially Designed Academic Content in English

Design posters depicting the various ways in which transportation has caused problems and how they can be solved using vocabulary from day 2

SCIENCE

Primary Language Instruction

Explain centers: 1) How Can Boats Move Without Sails? 2) How Does Wind Affect Boats? (See attached sheets)

Specially Designed Academic Instruction in English

Do centers. Teacher and aide will circulate reviewing with students the content vocabulary.

ART

Primary Language Instruction

Explain concepts in the book entitled Boat Book by Gail Gibbons and use illustrations as an inspiration for an art activity.

Specially Designed Academic Instruction in English

Do art activity. Students will write a sentence about their boat at the Botticelli of their picture.

P.E.

Primary Language Instruction

Explain activity. Set up obstacle course representing reefs, shallow water, etc. Have students form "boats" by holding on to each other and proceed through obstacle course. Put markers symbolizing buoys with warnings of dangerous areas.

Specially Designed Academic Content in English

Do activity. Each group of students forming a boat must read markers and determine course through the imaginary bay.

DAY 4-Neighborhoods

LANGUAGE ARTS

Primary Language Instruction

Explain concepts in A House is a House for Me by Mary Ann Hobby

Specially Designed Academic Content in English

Do activity Where do I live? (See attached sheet)

MATH

Primary Language Instruction

When doing Where do I live? activity students will discuss shapes of houses, sizes, comparisons.

Specially Designed Academic Content in English

Students will be placing their houses on butcher paper and make decisions as to how to group and space them.

SOCIAL STUDIES

Primary Language Instruction

Discuss the concept of neighborhood using an atlas or map of school's neighborhood.

Specially Designed Content in English

Have students return to their houses on butcher paper and decide again how to group their houses thinking of the concept of neighborhood. Then they will trace around their houses. This will create a map when houses are removed. Compare and contrast with real map.

SCIENCE

Primary Language Instruction

Discuss concepts from Building a House by Byron Barton.
Discuss how houses are built.

Specially Designed Academic Instruction in English

Divide students in groups of 5 or 6 and give each one a piece of paper. Have each group create a sequence book or poster, having each child take a different step in building a house. Share finished products and discuss.

MUSIC

Primary Language Instruction

Music/Drama: Explain words from Tree House by Shel Silverstein

Specially Designed Academic Instruction in English

Sing and dramatize song using solfegio notes so, mi.

P.E.

Primary Language Instruction

Explain rules to ET Go Home. Class in divided into four teams. Each team has a home base which are the four corners of a large marked off square on playground. On a signal, all students move in a pre-determined manner using content vocabulary. On another signal different from the first one, leader or teacher says ET Go Home and all students must return to home base and kneel. The team who reaches home base first and is kneeling gets a point.

Specially Designed Academic Instruction in English

Play game having students take turns being the leader. Alternate giving instructions orally and with written signs.

Day 5-Country/City

LANGUAGE ARTS/ART

Primary Language Instruction

Discuss concepts in The World of Art Cities: Through the Eyes Of Artists by Wendy & Jack Richardson. Help students to develop discussion of the people who live in these different environments and cultures and the things that they might do in these environments.

Specially Designed Academic Instruction in English

Using National Geographic and other magazines, students will make class book showing examples of houses from different parts of the world and the people who live there. Students will then share their books and talk about the pictures they have selected.

MATH

Primary Language Instruction

Read City Mouse, Country Mouse (comes in Spanish)

Specially Designed Academic Instruction in English

Using Venn graph, have students tell similarities and differences found in the city and in the country.

SOCIAL STUDIES

Primary Language Instruction

Display books and present concepts about various careers. Discuss city careers and country careers to help students get a feel for what they might want to do some day.

Specially Designed Academic Instruction in English

Have children choose a career that they might want to do someday. Give each child a piece of paper or the body blank and have them draw themselves in the appropriate attire. Children orally share final product.

MUSIC/DRAMA

Primary Language Instruction

Present concepts from the Community Helpers Song.

Specially Designed Academic Instruction in English

Sing song and dramatize the various activities that community helpers would do. Song should be presented first in ELD using the method decribed for theme music in ELD activities section.

El Cohete

Tito, tito, capotito,
sube al cielo
y pega un grito.

El Semaforo

Tengo un ojo verde
y otro colorado
con el rojo se paran
los coches;
con el verde siguen
caminando.

El Helicoptero

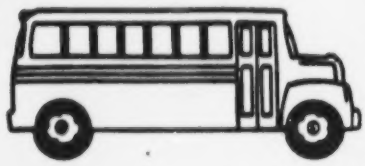
Sin alas lo mismo vuela,
se parece a una lnagosta,
un molino en su cabeza,
en claquier sitio se posa.

El Cochecito

Un cochecito compró papá
para llevarnos a la ciudad.
Grande, muy grande quisiera estar
para poderlo yo manejar
asi, asi, asi.
Toma el volante mi papá,
asi, asi, asi,
pronto podre yo manejar.

El Viejo Autobus

-Mark Porter



El viejo autobus
se arrastra
ladera abajo,
quejandose
de los achaques.

Preferiria quedarse estirado en el
estacionamiento,
calentandose
bajo el sol matutino,
claro,
pero
aun le queda el largo recorrido por las calles de ciudad
antes de que pueda volver a descansar.

Pasa el día
recogiendo pasajeros aqui
y depositandolos alla,
llevando su pesada carga por toda la ciudad
sin que nadie le preste la menor atencion.

Por fin,
terminado su dia de trabajo,
vuelve con alivio al estacionamiento,
se desliza tranquilamente en su sitio
entre los otros autobuses,
apaga los faroles,
apaga el motor,
suspira
y duerme.

Sobre el Mar

-Dora Alonso

Sobre el mar
hay una barca,
sobre la barca
un barquero,
sobre el barquero
una nube,
sobre la nube
un lucero.

Marinero

-Tradicional

Marinero que se fue
a la mar y mar y mar
a ver que podia
ver y ver y ver,
y lo unico que pudo
ver y ver y ver,
fue el fondo de la
mar y mar y mar.

The Train Station

Directions for The Train Station:

- Color one train marker red, one blue, one green, and one yellow.
- Read the problems to the students.
- Using the markers, students place the markers in the appropriate place according to the problem.
- When students have solved the problem, they record their results.

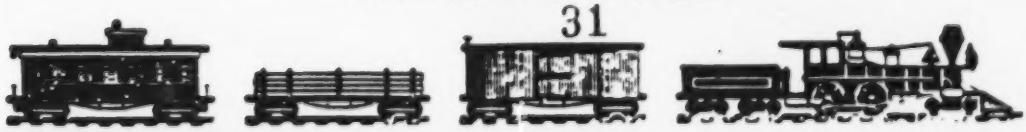
Problem 1: The red train is on the far right.
The blue is not next to the red train or the green train.

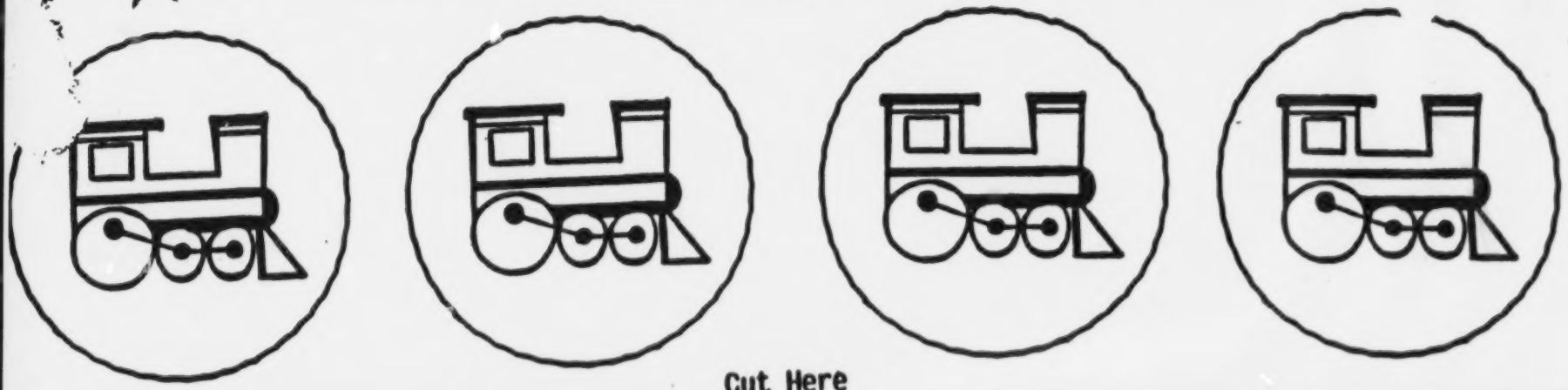
Problem 2: The blue train is not on the far right or the far left.
The green train is between the blue train and the red train.
The yellow rain is on the far left.

Problem 3: The blue train is only next to the green train.
The yellow train is second from the left.

Problem 4: The green train is not next to the yellow train.
The yellow train is not first or second.
The red train is next to the yellow train only.

Problem 5: The yellow train is second.
The blue train is between the red train and another train.





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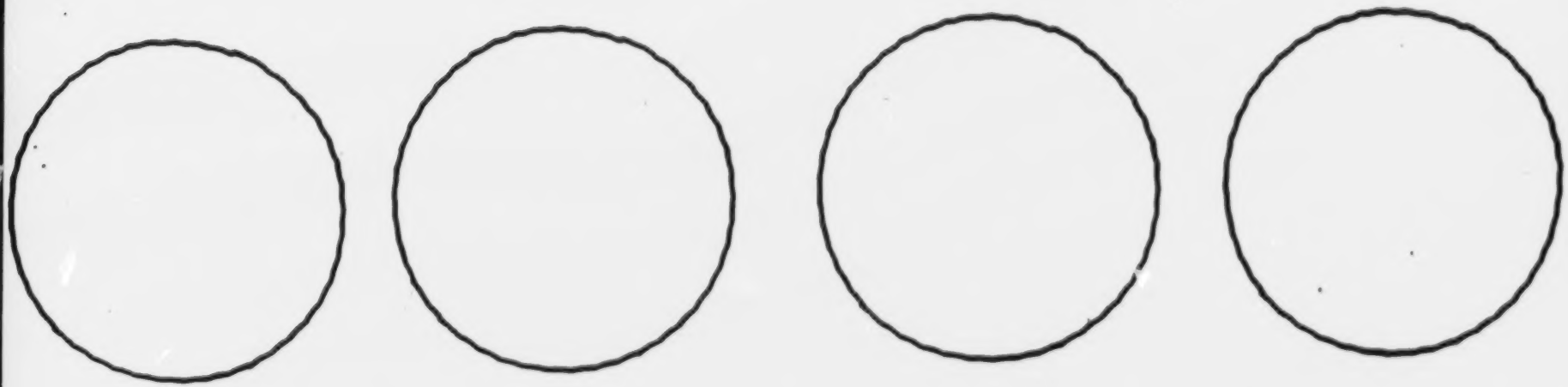
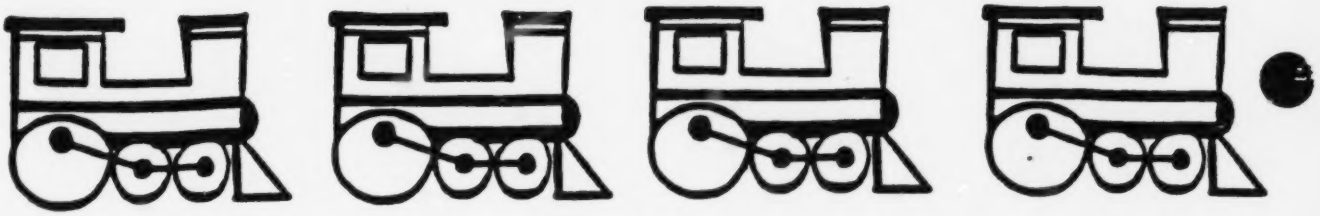


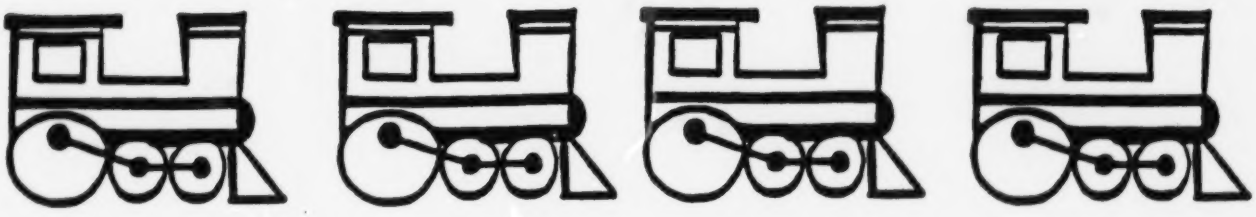
32

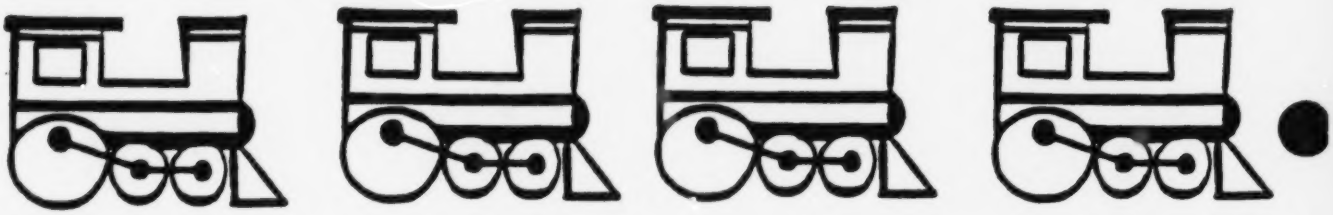
33

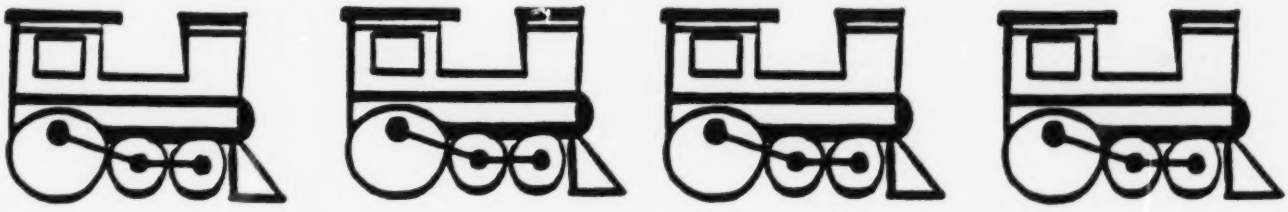
Use this board to help you solve <u>The Train Station</u> problems.

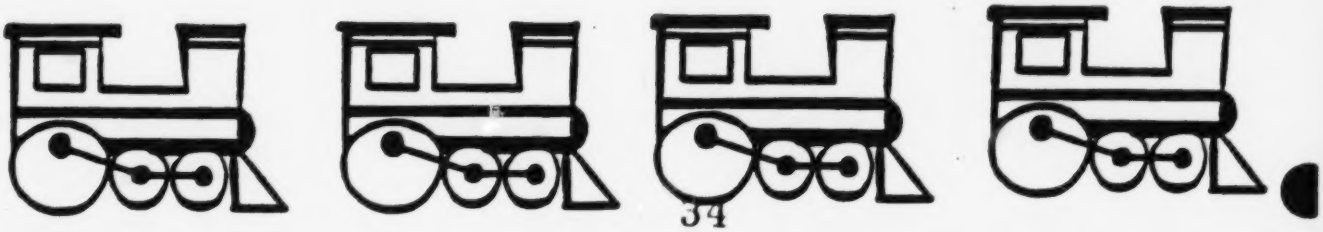
Name_____

1. 

2 

3 

4 

5 

Why Do We Need Seatbelts?

Objective: Objects not tied down continue to move when the vehicle stops. This is called inertia.

Materials: Books
Chair or cart with wheels

Procedure: Stack the books on the chair or top of the cart.

- Push the chair forward.
- Quickly stop the chair.
- What happens?
- Why?

FYI: Inertia is a resistance to any change in motion. A moving object remains in motion until some force stops it. A stationary object remains stationary until something forces it to move. Think of being in an airplane when it takes off. Inertia is the resistance for your body to move. Therefore, you seem to be thrust into the chair.

Optional Activity:

Materials: Toy car
Wooden Block
Book or piece of flat wood
Ruler

Procedure:

- Make a ramp with the book or wood.
- Tape a ruler down about 1 foot away from the low part of the ramp.
- Place a block on top of the car.
- Put the car at the top of the ramp.
- Let go.
- What happened? Why? Write about it in your journal.

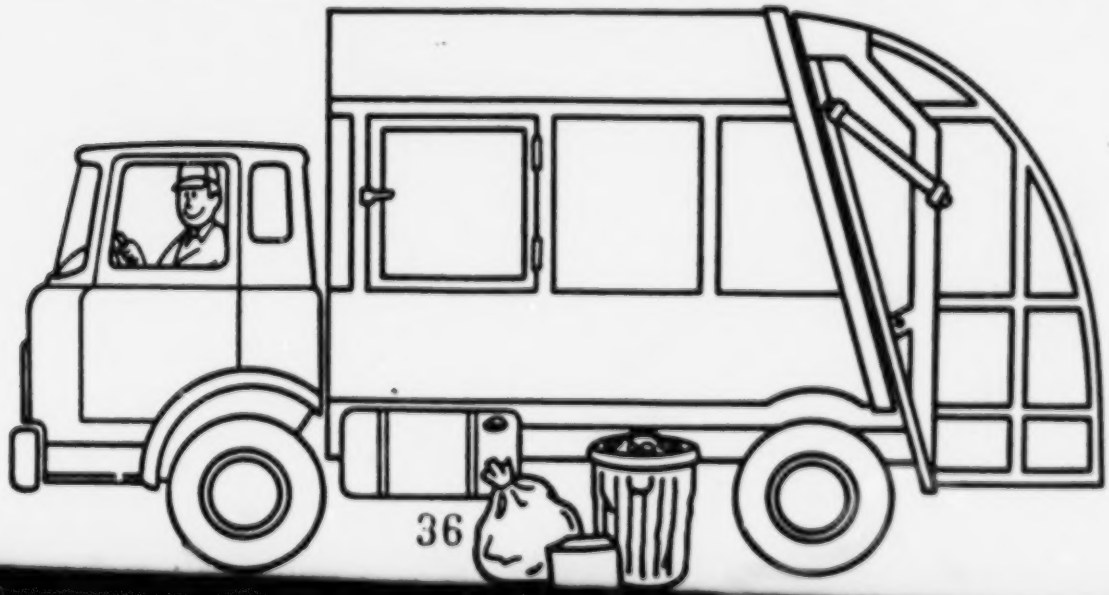
Which Objects Need More Energy To Move?

Objective: Heavier objects resist movement.

Materials:
2-liter bottle
rubber band
1 foot of string
scissors
ruler

Procedure:

- Place the rubber band around the bottle about 2 in. from the bottom.
- Attach the string to the rubber band.
- Pull on the string until the bottle starts to move.
- Measure the amount the rubber band stretches.
- Fill the bottle with water.
- Pull on the string until the bottle starts to move.
- Measure the amount the rubber band stretches.
- Which stretched more before the bottle moved? Why?



What Affects Motion?

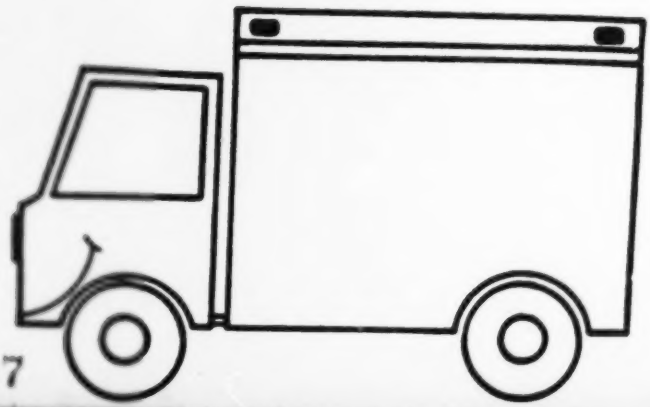
Objective: The texture of a surface affects motion.

Materials:

5x12" Poster board card	Glue bottle
Ruler	10 in. string
Paper clip	Pen
Rubber band	Wax paper
Scissors	Sandpaper

Procedure:

- Fold the posterboard in half lengthwise.
- Cut a slit about 1/2 in. long, 2 inches from the end of the card.
- Put the paper clip in the slit and slip the rubber band on the paper clip.
- Loop the string through the rubber band.
- Place the paper on the card on the table.
- Place the glue bottle at the end of the card.
- Gently pull the string to straighten the rubber band.
- Mark the card at the end of the rubber band and label this "Start."
- Pull the string until the card begins to move.
- Measure how much the rubber band stretches.
- Tape a sheet of wax paper and a sheet of sandpaper to the table.
- Move the card with the glue bottle across the wax paper and sand paper by pulling the string.
- Measure and record how much the rubber band stretches each time.
- What happened? Why?



Orff Teaching

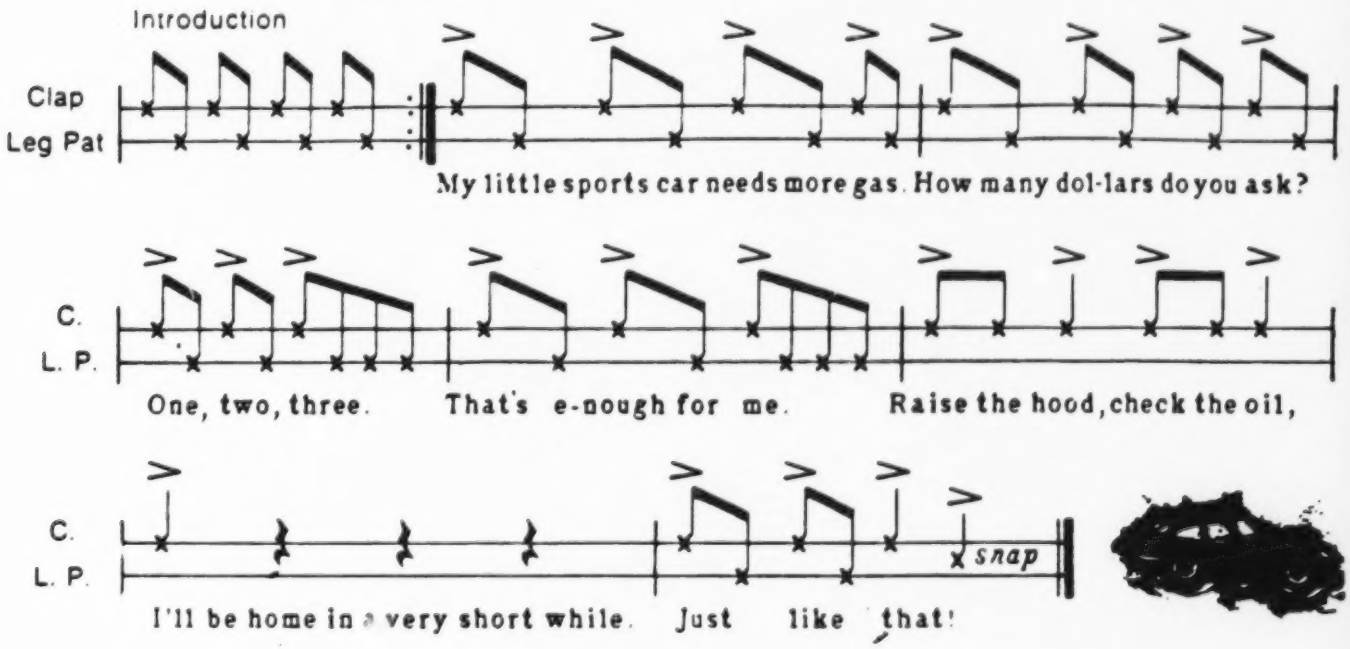
RHYTHMIC SPEECH
WITH ACCENTS

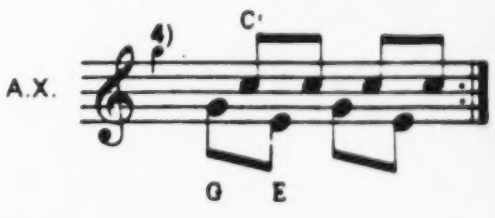
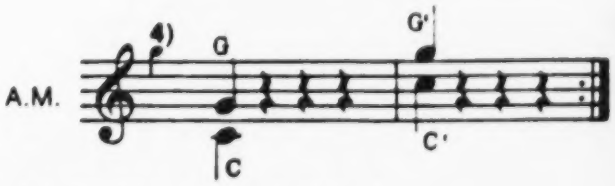
When you talk, you usually say the important words a little louder.

This is called an *accent*. In music, an accent looks like this >

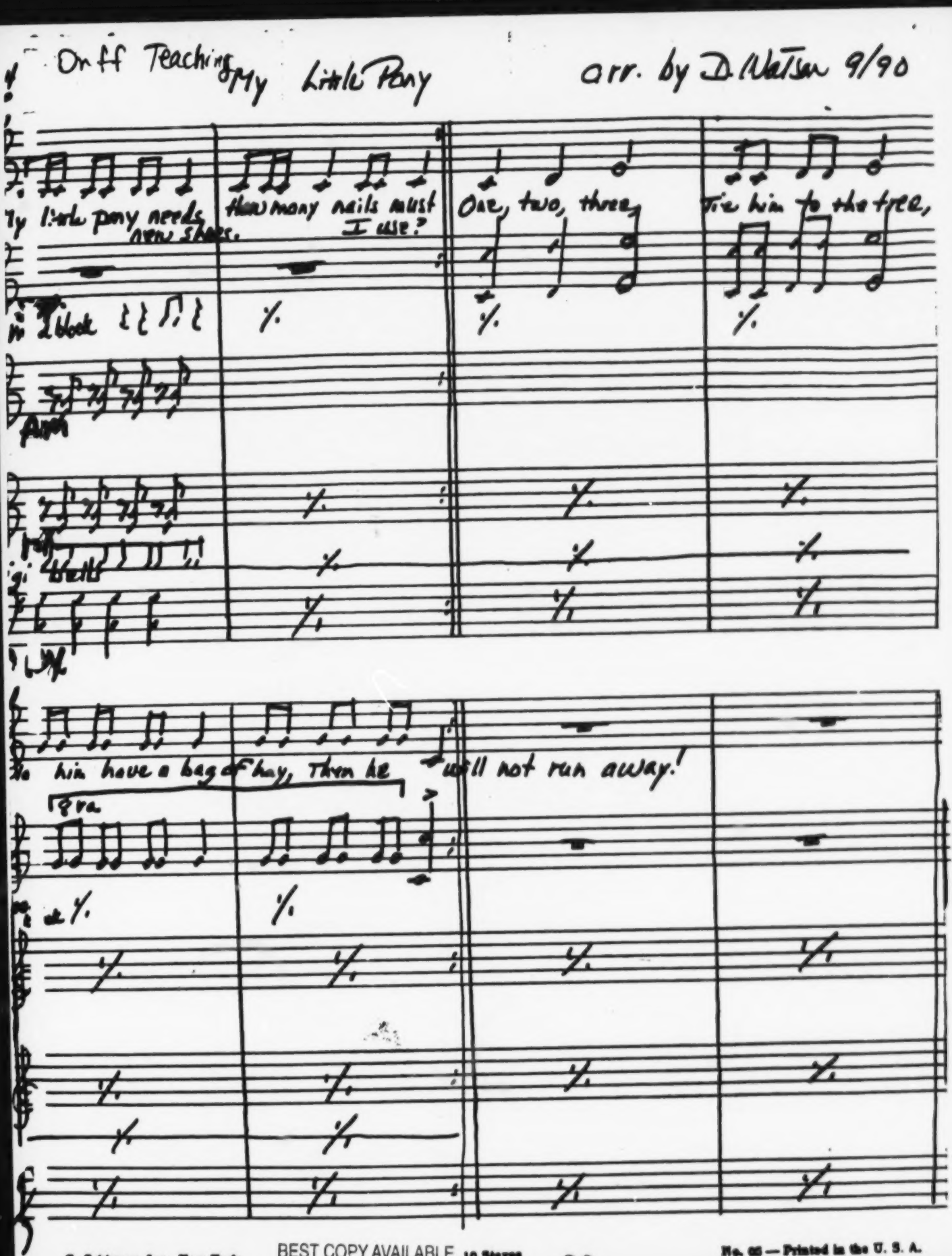
MY LITTLE SPORTS CAR

1. Clap and leg pat using — "See you later, alligator" as an introduction
2. Add the words.


Introduction
Clap
Leg Pat
My little sports car needs more gas. How many dol-lars do you ask?
C.
L. P.
One, two, three. That's e-nough for me. Raise the hood, check the oil,
C.
L. P.
snap
I'll be home in a very short while. Just like that!

WEATHER REPORT Murray McNair

1. A. Class:
"Ev'ry day has weather,
But tell us if you can,
What kind of weather's coming?
We'd really like to plan."

B. Weatherman rises and calls out his prediction for tomorrow.
Example: "Tomorrow will be stormy with heavy rain and thunder!"
C. Players at instruments imitate weatherman's report in sound.

2. Repeat A. (class), B. (new weatherman), C. (new group of players).


Orff Teaching
My Little Pony
arr. by D. Watson 9/90
My little pony needs new shoes.
How many nails must I use?
One, two, three,
Tie him to the tree,
Give him a bag of hay, Then he will not run away!

How Do Wings Help Planes Fly?

Objective: The shape of an airplane's wings helps the plane to lift up.

Materials for each :

Paper strips cut 1"x7"
Paper strips cut 1"x12"
Regular paper clips
Straw
Scissors
Rubber band

Procedure:

- Make a circle out of each paper strip. Fasten with a paper clip.
- Slip the smaller loop of the paper clip into the ends of the straw. Adjust so that the loops are directly behind each other.

Front View

- Fly your plane.
- Make a traditional paper air-plane.
- Which do you like best?

Note: This is fun to do at the beginning of the school year.

Welcome Back

Teacher Information Sheet

Objective: To teach that the movement of air over the rotors creates the area of low air pressure needed to keep a helicopter aloft.

Problem: How can you make the paper teacher spin?

The arms of the paper teacher act like rotor blades on a helicopter. The movement of air past the teacher's arms provides lift at a speed that's enough to slow her descent and lets her float softly to the ground. To make the teacher spin, one arm is bent forward and the other backward. A paper clip on her feet provides the correct amount of weight to make her spin.

Materials Needed: (* indicates student worksheet answers)

1. Student Scientific Method sheet
2. Individual Student Predictor
3. Classroom graph
4. *Teacher pattern on page 8
5. *Paper clip

Teaching Procedure:

1. Show students materials to be used in the experiment and state the problem.
2. Pass out individual student predictors and method sheet. Students mark their hypothesis.
3. Chart all student predictions on a class graph. Ask volunteers to explain the reasons for their predictions.
4. Discuss the graph with the class focusing on mathematical concepts.
5. Conduct the experiment. (See "Procedure" on the Scientific Method sheet.)
6. Discuss results as explained in the objective.
7. Have the class complete the student Scientific Method sheet.

Try this for fun:

Try different shapes for various holidays. Cut out floating ghosts for Halloween, Santas for Christmas, etc.

Example of a classroom graph:

Fold a piece of butcher paper in half, and sketch the outline. Cut it out. Plain tag can be used for a simple pictograph.

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Name: _____

Scientific Method
Welcome Back

Problem: How can you make the paper teacher spin?

Collect Materials:

1. _____

2. _____

Hypothesis: The teacher will spin when _____ .

A. she is dropped with a paper clip on her feet
B. she is dropped with both arms bent forward
C. she is dropped with a paper clip on her feet and one arm bent forward and one arm bent back
D. she is dropped with both arms over her head

Procedure: Try all of the above choices and see which one works!

Conclusion: The teacher spun gracefully down when _____

_____

Draw a picture of our experiment:

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Mi Aeroplano

-Isabel Freire de Matos

Payaso del viento
sube mi avión,
haciendo piruetas
en medio del sol.

Se mira en la espuma
de plata y azul,
y torna en juguetes
los rayos de luz.

vuela serenito
como un picaflor
las alas abiertas
sobre el corazon.

Cometa en las nubes
del atardecer,
mi atardecer,
mi aeroplano baja
y sube otra vez.

Yo Quiero Ser...

-Beatriz

Cada uno hace, a su modo,
lo que sabe hacer mejor;
el pescador pesca peces
y cantando esta el cantor.

Un dia yo quiero ser
marinero o vigilante;
hoy quiewser pastelero
y cuidador de elefantes.

Yo quiero escribir un libro
como hacen los escritores
o decirte: "sana... sana...."
como dicen los doctores.

Yo quiero cazar un tigre
muy pequeño, todo a rayas,
para mirarlo un ratito
a dejarlo que se vaya.

Bicicletas

-Angela Figuera Aymerich

Por la carretera,
geometria alegre
de las bicicletas:
Rueda, rueda, rueda....

Por la cuesta arriba,
duro a los pedales:
Tira, tira, tira...

Por la cuesta abajo,
—chopos que se alejan
a uno y otro lado—...
Vuela, vuela, vuela.....

La Ciudad

-Alma Flor Ada

Como una inmensa cuerva
de Alí Babá
es todo lo que encierra
nuestra ciudad.

Hay tiendas y comercios
en cantidad.
De edificios y casa
gran variedad.

Las fieras de zoologico
son de verdad.
En la jugueteria, hay juguetes
de calidad.

¡Peces en el acuario,
cuadros en el museo,
hay cines y teatros,
de todo veo!

Lo que mas me gusta
de la ciudad
es que todos me tratan
con amistad.

Race Car Shuffleboard

Materials:

- Numbered track
- Toy Cars
- Recording sheet

Procedure:

- Choose a race car.
- Roll it down the track.
- Record the score.
- Repeat 2 more times.
- Add the three numbers to get your final score.

Extended Activities:

- Use different numerals on your track (2 digit, 3 digit).
- Use equations on the track (2+4=6)

Rolling On Dice Game

Materials:

- Dice
- Crayons
- Recording Sheet

Procedure:

- Roll the dice
- Add the numbers.
- Record the sum on the graph (recording sheet).
- Repeat until one form of transportation wins the race.

Rolling On Dice Game

2	3	4	5	6	7	8	9	10	11	12
scooter	bus	skates	boat	train	jet	trolley	van	skis	hot-air balloon	feet

Which finished first? _____ (name of transportation) _____ (number)

15 ¿Causa problemas el transporte?

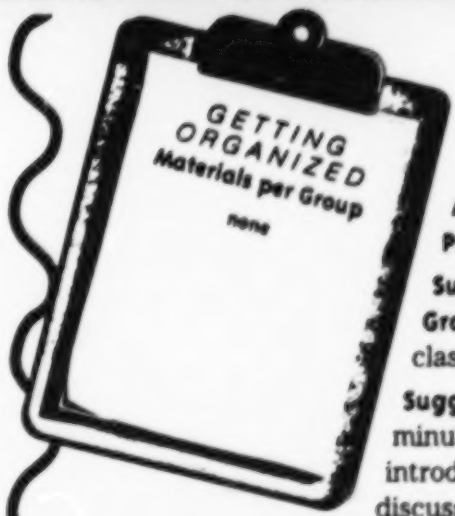
Can Transportation Cause Problems?

Superlibro Paginas 26-27

In the last lesson: Children continued to explore the subject of transportation by reading a book about transportation devices and systems used around the world.

In this lesson: Children discuss some of the problems caused by transportation systems.

In the next lesson: Children build cars and a bus, then compare the two methods of transportation to find solutions to some transportation problems.

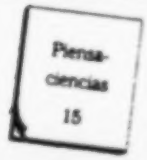


Advance Preparation: none

Suggested Grouping: entire class

Suggested Time: 5 minutes for introductory discussion; 10 minutes for discussion of Big Book; 5 minutes for follow-up discussion and conclusions

También para esta lección:



Software:

The Story Line

Grade Level Concept

People need to move living and nonliving things from place to place, and have invented ways to do this.

Subconcepts

People move things via land using various forms of energy.

People move things via water and air using various forms of energy.

Solving transportation problems has caused new problems that people are working to solve.

Lesson Concept

Cars, boats, and planes can cause problems such as traffic jams, air pollution, and depletion of natural resources.

Páginas 26-27

¿Causa problemas el transporte?
¿Qué pasa cuando se mueven los automóviles, los aviones, los barcos y los trenes?
¿Qué pasa cuando hay demasiados carros en las carreteras?
¿Por qué necesita esta trabajadora protegerse los oídos?
El aire está sucio cerca de este camión porque el camión quema petróleo. El petróleo se forma dentro de la Tierra a lo largo de millones de años. Los carros usan un producto del petróleo: la gasolina.

Tema: Sistemas e interacciones (Theme: Systems and Interactions)

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Content Background

Transportation can cause pollution, which harms our health and environment. It also consumes 27 percent of all energy used in the United States every year. Of the 17 million barrels of crude oil used every day, 11 million are used in transportation alone. About 8 million of these barrels are refined into gasoline for motor vehicles.

When fuel is burned to provide energy in transportation, it gives off some poisonous gases. But that is not the only threat — some of the gases undergo changes in the atmosphere to form acids that can destroy crops and natural environments.

Transportation also causes noise pollution. The roar of jet engines can be dangerous to our ears.

Crude oil takes millions of years to form. At the rate we are currently using fuel, we're going to use all there is in a few short decades. One way to save gasoline is to not use it at such a high rate. Carpools, public transit, non fuel-dependent transportation, and well-planned trips all help save gasoline.

Vocabulary: *gasolina (gasoline)*

Spanish Variants:
automobile: *automóvil, carro, coche, auto, vehículo*

Theme Connection: Systems and Interactions

Just as systems of waste disposal such as incineration and landfills contaminate the air and harm the ecosystem, technological systems for transportation also create problems such as air pollution and depletion of natural resources.

Naive Conceptions

Children may think there is an unlimited supply of oil to use in producing various types of fuel. Talk to them about the fact that it took millions of years to form the oil deposits that are being mined today.

Curiosity Place
In 1885, Karl Benz of Germany produced the first automobile.
En 1886, Karl Benz construyó el primer automóvil en Alemania.

¿Qué sabemos ya? ¿Qué queremos saber?

1 Activate

Ask children to help you make a list of places they go. **¿A qué lugares van de vez en cuando? Vamos a hacer una lista.** Have them name places close by and some far away (school, a store or movie theater, the home of a relative who lives in another town or state). **Nombren lugares que quedan cerca y otros que están lejos. (escuela, cines, teatros, otros pueblos, ciudades o estados)** Ask them what form of transportation they used to get there. **¿Qué medio de transporte necesitan para ir a esos lugares?** Write the responses to these questions on the Tablero de notas. Then talk about how different vehicles are powered. **¿Qué tipo de fuerza usan distintos vehículos?** Write these responses on the Tablero de notas also.

Considering Second-Language Learners

Restate the main point of the Superlibro page in simple language while using visual clues to make your language comprehensible.

¿Cómo lo averiguamos?

2 Explore

Read through the lesson on pages 26 and 27 of the Superlibro to begin a discussion of some problems associated with transportation systems. **¿Qué problemas causa el transporte?** What kinds of transportation are being used in the first picture? **¿Qué tipo de transporte ven en el primer dibujo?** What happens when there are a lot of cars and trucks? **¿Qué pasa cuando hay muchos carros y camiones?** Make a list on the Tablero de notas of problems that children suggest about cars. **Vamos a hacer una lista de los problemas que crean los carros.** Ask them what kind of transportation is being used in the second picture. **¿Qué tipo de transporte ven en el segundo dibujo?** What problems can they see there? **¿Qué problemas ven?** Why does the air traffic director need to protect her ears? **¿Por qué la muchacha que dirige el tráfico aéreo necesita protegerse los oídos?** Are other kinds of transportation noisy? **¿Qué otros tipos de transporte hacen mucho ruido?** Ask children if any of them live near a busy road or street. **¿Quién vive cerca de una carretera o calle por la que pasan muchos vehículos?** What kinds of sounds do they hear? **¿Qué ruidos oyen?** Write these responses on the Tablero de notas also. Look at the final illustration of the truck producing exhaust smoke. **Miren la foto del camión echando humo.** What problems does the smoke cause? **¿Qué problemas causa el humo?** What happens when lots of cars and trucks produce smoke? **¿Qué pasa cuando muchos carros y camiones echan humo?** Then talk about the fact that oil was formed from organisms that lived millions of years ago, and that people are using oil faster than it is being formed. **El petróleo se formó de organismos que vivieron hace millones de años. Hoy en día usamos mucho más petróleo del que produce la Tierra.**

Ask children to think of other kinds of problems that may be related to transportation. **¿Qué otros problemas causa el transporte?** What happens when someone decides to build a road in a certain area? **¿Qué pasaría si deciden construir una carretera en un lugar determinado?** Suppose that you lived there—what would your family have to do? **¿Qué harían sus familias si vivieran en ese lugar?** Let them explore the question.

¿Qué aprendimos?

3 Apply

The class has made a list of some of the problems associated with transportation methods. **Vamos a repasar la lista de los problemas que causa el transporte.** Also ask them to think about how the fuel they use gets transported. **¿Cómo se transporta el petróleo?** Can they think of any problems that people might have in getting oil? **¿Qué problemas pueden ocurrir al tratar de conseguir petróleo?** If available, you might show children a photograph of the effects of an oil spill. **Esto es lo que pasa cuando hay un derrame de petróleo.**

¡PIENSA!
¿Por qué crees que debemos usar menos petróleo y gasolina?

Extend Learning

Review the Tablero de notas. Ask children to suggest ways that they might save gasoline and write their responses on the Tablero de notas. **¿Cómo podemos conservar gasolina?** Children don't drive, but they are often driven places by others. How could they help limit the number of car trips that they take? **¿Cómo pueden disminuir el uso de los carros?** Are there ways they could travel without getting in the car? (by walking, riding a bike, taking a bus) **¿Podemos ir de un lugar a otro sin usar un carro? (Podemos caminar, montar bicicleta, tomar el autobús.)**

This would be a good time to distribute Piensa-ciencias 15.

Thinking Skills:

Recognizing the Main Idea and Supporting Details; Applying Information to New Situations

¿Lo aprendimos bien?

Assessing Performance

PROCESS ASSESSMENT

As you discuss with children the problems with transportation systems, observe whether they seem to understand the reasons for these problems (more cars create more pollution; vehicles and the fuel they use cause forms of pollution). Do they formulate suggestions for ways to save fuel and for alternative means of transportation? **¿Qué podemos hacer para conservar gasolina? ¿De qué otras maneras podemos ir de un lugar a otro?**

Options

CONSTRUYE UNA CIUDAD
BUILD A MODEL OF A CITY
MORE SCIENCE

Using a large piece of brown paper, lay out a model community. **Vamos a construir una ciudad sobre este papel de estraza.** (Use your local area as a basis for the area.) Milk cartons and juice boxes can be used for apartment buildings and houses; shoe boxes for warehouses, manufacturing plants, and other large structures. **Vamos a usar envases de cartón para hacer las casas y edificios, y cajas de zapatos para hacer fábricas y almacenes.** Children can make cardboard cars, trucks, and trains, and place them on a series of roads and tracks that they have drawn on the brown paper. **Hagan carros y camiones. Pónganlos en las carreteras que dibujen en el papel de estraza.** As they play with these vehicles, have them observe and discuss problems associated with transportation. **¿Qué problemas causa el transporte?**

VIDA SUBTERRÁNEA
GO UNDERGROUND
INTEGRATING LITERATURE

Read and discuss *La estación de ferrocarril* by Philippe Dupasquier (Madrid: Anaya, 1985), which takes the reader on a tour of a bustling train station. **Vamos a leer un libro sobre todo lo que pasa en una estación de ferrocarril.**

16

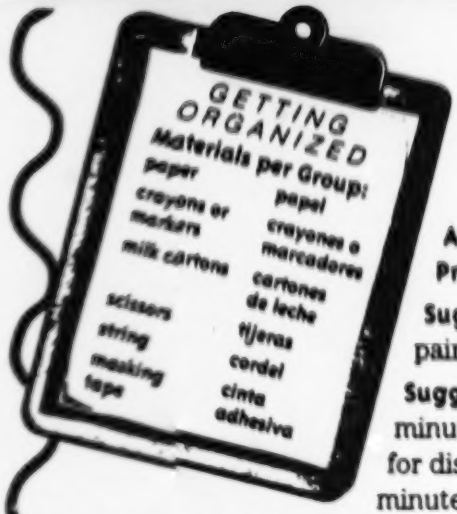
Superlibro
Páginas 28-29

¿Cómo podemos resolver los problemas del transporte?
How Can We Solve Some Transportation Problems?

In the last lesson: Children discussed some of the problems caused by transportation systems.

In this lesson: Children build cars and a bus, then compare the two methods of transportation problems.

In the next lesson: Children will review methods of transporting people and objects and make a class mural or collage.

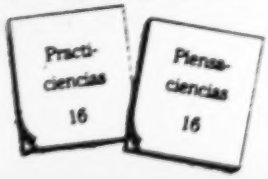


Advance Preparation: none

Suggested Grouping: pairs

Suggested Time: 5 minutes introductory for discussion; 25 minutes for doing the activity; 10 minutes follow-up for discussion and conclusions

También para esta lección:



Software:

The Story Line

Grade Level Concept

People need to move living and nonliving things from place to place, and have invented ways to do this.

Subconcepts

People move things via land using various forms of energy.

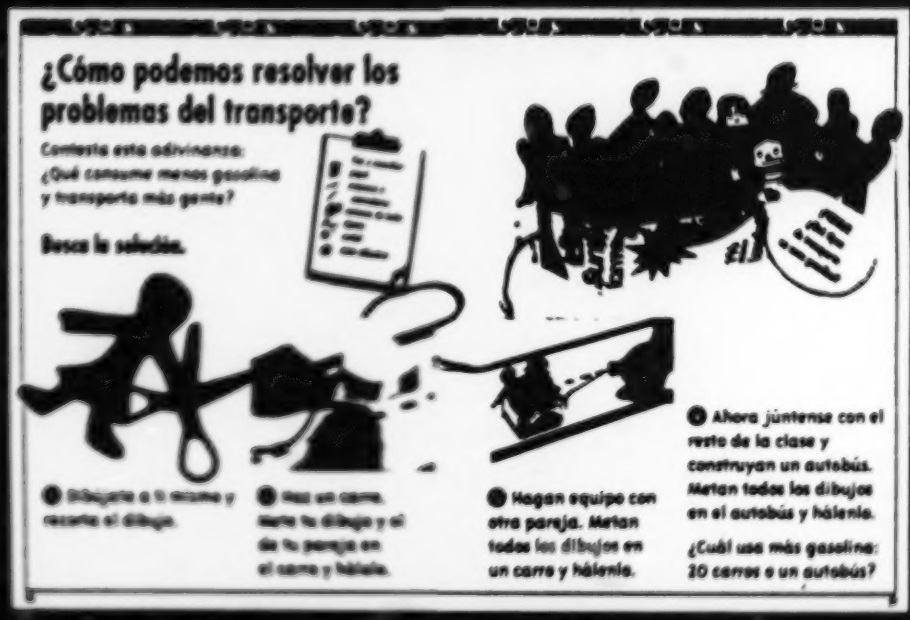
People move things via water and air using various forms of energy.

Solving transportation problems has caused new problems that people are working to solve.

Lesson Concept

Public transportation and carpools can reduce some of the problems associated with transport vehicles.

Páginas 28-29


¿Cómo podemos resolver los problemas del transporte?
Contesta esta adivinanza:
¿Qué consume menos gasolina y transporta más gente?
Busca la solución.
1 Dibújate a ti mismo y recorta el dibujo.
2 Haz un carro. Mete tu dibujo y el de tu pareja en el carro y hálalo.
3 Hagan equipo con otra pareja. Metan todos los dibujos en un carro y hálenlo.
4 Ahora júntense con el resto de la clase y construyan un autobús. Metan todos los dibujos en el autobús y hálenlo.
¿Cuál usa más gasolina: 20 carros o un autobús?

Tema: Sistemas e interacciones (*Theme: Systems and Interactions*)

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¿Qué sabemos ya? ¿Qué queremos saber?

1 Activate

Read the introductory question on page 28 of the Superlibro and have children think of ways to move more people while using less gasoline. (They may think of such things as ferries, subways, buses, vans, station wagons, or airplanes.) **¿Cómo podemos transportar más gente usando menos gasolina? (barcas de pasaje, trenes subterráneos, autobuses, furgonetas, camionetas, aviones)**

Considering Second-Language Learners

Second-language learners can make a poster showing different forms of transportation that move many people at once, such as ocean liners, double-decker and regular buses, and jet planes. **Hagan un cartel de medios de transportar muchas personas al mismo tiempo. Incluyan barcos de pasajeros, autobuses de dos pisos, aviones, y otros medios.**

¿Cómo lo averiguamos?

2

Read through the Superlibro activity on pages 28–29. Children's cars will travel a road that goes from a parking lot on one side of the room to a circus tent on the other. **Con nuestros carros, vamos a ir del estacionamiento, que está en este lado del salón, hasta el circo que está al otro lado.** In both places, mark off a square with masking tape. Then mark the road with masking tape.

Busca la solución.

1. Distribute Practi-ciencias 16. Have children draw small, full-figure drawings of themselves and cut them out. **Dibújense ustedes mismos. Recorten sus dibujos.**
2. Children should lay each washed milk carton on its side, then cut off the top half to make a car. **Pongan el cartón de leche de lado y córtenlo por la mitad para hacer un carro.** Attach string or cord to cars so children can pull them. **Amárrenlo con cordel y hálenlo.** Tell them to fold their figures so they look like they're sitting down, and use rolled masking tape to attach pictures to cars. **Doblen sus dibujos como si estuvieran sentados y péguenlos al carro con cinta.** Give children time to pull their vehicles down the road. **Halen los carros hasta el otro lado del salón.** Ask them to take as many trips down the road as they need in order to move the whole class. **Den todos los viajes necesarios para llevar a toda la clase hasta el otro lado.**
3. Have pairs team up and repeat the activity, this time moving four riders in each car. **Formen parejas y trabajen en equipo. Ahora van a llevar a cuatro personas al mismo tiempo.**
4. Have children construct a bus out of the larger carton and have all the children tape their pictures to the bus and pull it along the road. **Hagan un autobús con un cartón sin cortar y pongan todos los dibujos dentro de él.** Now how many trips does it take to move the class? **¿Cuántos viajes tenemos que dar para llevar a toda la clase?**

Process Skills:

Observing; Comparing; Communicating

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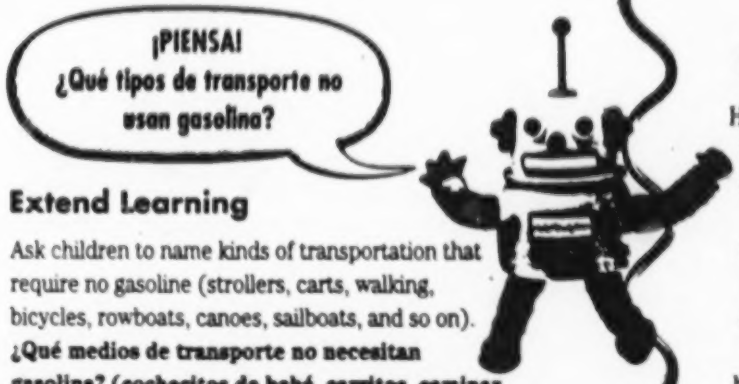
¿Qué aprendimos?

3 Apply

Ask children to compare transporting the class in cars and in a bus. **¿Cómo transportamos a la clase? ¿Qué diferencias notaron entre los carros y el autobús?** How does using one vehicle to move the entire class affect energy consumption? **¿Conservamos gasolina usando sólo un vehículo?** Was it more work to take one trip or to take several? **¿Qué nos costó más trabajo, dar un viaje o dar varios?** What's one good answer to the transportation riddle? **¿Cuál sería una buena respuesta a la adivinanza del transporte?** (They may suggest solar automobiles or fewer cars and more buses.) What uses less fuel, ten cars or one bus? **¿Cuál usa más gasolina, diez carros o un autobús?** What makes less traffic? **¿Cuál disminuye el tráfico?** What are the streets with the most traffic in your neighborhood? **¿Cuáles son las calles de mayor tráfico en nuestra comunidad?** Why are there so many cars? **¿Por qué hay tantos carros?** What could people do to solve the traffic problem? **¿Qué podemos hacer para solucionar los problemas del tráfico?**



Extend Learning

Ask children to name kinds of transportation that require no gasoline (strollers, carts, walking, bicycles, rowboats, canoes, sailboats, and so on). **¿Qué medios de transporte no necesitan gasolina? (cochecitos de bebé, carritos, caminar, montar bicicleta, botes de remo, canoas, veleros)** List their responses on the Tablero de notas. What kinds of transportation don't require vehicles? (running, walking, carrying items in backpacks) **¿Qué tipos de transporte no requieren vehículos? (correr, caminar, llevar cosas en mochilas)**

This would be a good time to distribute Piensa-ciencias 16.

Thinking Skills:

Making Physical Models; Drawing Conclusions

¿Lo aprendimos bien?

Assessing Performance

PROCESS ASSESSMENT

After completing the activity, children's responses to questions should reflect an understanding that buses burn less gasoline and create less traffic in moving a group of people from one place to another.

Options

¿CUÁNTOS CABEN?
HOW MANY PEOPLE CAN YOU FIT?

MORE SCIENCE

Use shoe boxes and experiment with trying to fit comfortably as many people as possible into your shoe box train car. **Vamos a ver cuántas personas caben cómodamente en nuestro vagón del tren.** Make people of oak tag and bend them at their feet to stand in the vehicle. String the shoe boxes together and make an engine to pull them all.

¡QUÉ EMBOTELLAMIENTO!
TRAFFIC JAM!

INTEGRATING DRAMATIC ARTS

Have children role-play being in cars that are stuck in a traffic jam. **Vamos a imaginarnos que estamos en un embotellamiento.** Put several children in one car and have several cars full. **Algunos irán juntos en el mismo carro y otros solos.** What are problems with being stuck in traffic? **¿Qué problemas causan los embotellamientos?** How do children and adults feel when they are stuck, late, breathing pollution, and hungry? **¿Cómo se sienten cuando andan atrasados, el tráfico está detenido, tienen hambre y están respirando aire contaminado?** Would it be easier to be stuck by yourself or with someone else? **¿Sería mejor estar acompañados o solos?** Why? **¿Por qué?** Also, try role-playing being in a bus that is not stuck. **Imagínense que están en un autobús que no está en el embotellamiento.**

Content Background

We must find ways to move people and things using less fuel.

There are 143 million cars on the road today, and 167 million people who travel by automobile. This means that many cars are carrying only the driver. Each year more cars are on the road, which creates greater amounts of pollution. If more people would carpool, or use buses or trains, the results would be less pollution and road congestion, less environmental damage from the mining (such as oil drilling) needed to obtain the fuel used in cars, and less rapid depletion of these scarce fossil fuels.

Using buses is one example of alternatives to travel by car. Because a bus can hold more passengers than a car, it can move a greater number of people from one location to another. If 50 people who each drove a car were to take the bus instead, there would be 50 fewer cars on the road and less fuel would be used.

Spanish Variants:

bus: *autobús, ómnibus, camión, guagua, colectivo*
parking lot: *estacionamiento, parqueo*
traffic jam: *embotellamiento, atasco, tranque*

Theme Connection: Systems and Interactions

Moving a group of people in one vehicle can save fuel. As this lesson shows, people have devised systems such as using buses for transporting large numbers of people. Nature's systems sometimes exhibit the same kind of efficiency. Seeds inside seed pods eventually travel to new locations, often resulting in a new group of plants in those locations.

Curiosity Place

Camille Genatzy, from Belgium, invented an electric car that could go up to 65 m.p.h. in 1899! En 1899, Camille Genatzy, de Bélgica, inventó un carro eléctrico que podía viajar a 65 millas por hora.

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15

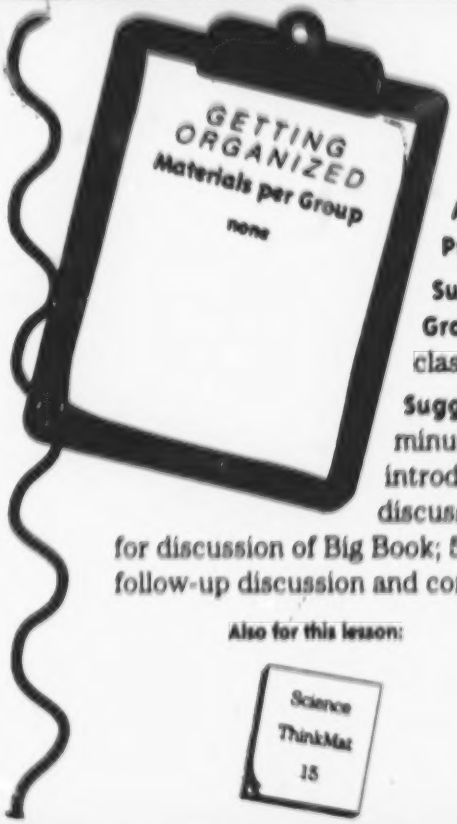
Big Book
Pages 26-27

Can Transportation Cause Problems?

In the last lesson: Children continued to explore the subject of transportation by reading a book about transportation devices and systems used around the world.

In this lesson: Children discuss some of the problems caused by transportation systems.

In the next lesson: Children build cars and a bus, then compare the two methods of transportation to find solutions to some transportation problems.



Advance Preparation: none

Suggested Grouping: entire class

Suggested Time: 5 minutes for introductory discussion; 10 minutes for discussion of Big Book; 5 minutes for follow-up discussion and conclusions

Also for this lesson:

Software Option

The Story Line

Grade Level Concept

People need to move living and nonliving things from place to place, and have invented ways to do this.

Subconcepts

People move things via land using various forms of energy.

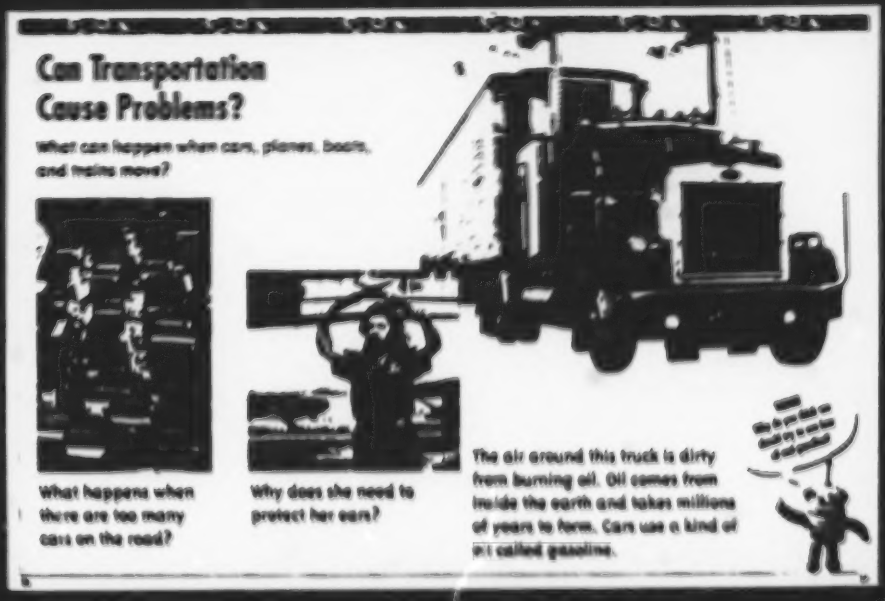
People move things via water and air using various forms of energy.

Solving transportation problems has caused new problems that people are working to solve.

Lesson Concept

Cars, boats, and planes can cause problems such as traffic jams, air pollution, and depletion of natural resources.

Pages 26-27


Can Transportation Cause Problems?
What can happen when cars, planes, boats, and trains move?
What happens when there are too many cars on the road?
Why does she need to protect her ears?
The air around this truck is dirty from burning oil. Oil comes from inside the earth and takes millions of years to form. Cars use a kind of oil called gasoline.

Theme: Systems and Interactions

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Content Background

Transportation can cause pollution, which harms our health and environment. It also consumes 27 percent of all energy used in the United States every year. Of the 17 million barrels of crude oil used every day, 11 million are used in transportation alone. About 8 million of these barrels are refined into gasoline for motor vehicles.

When fuel is burned to provide energy in transportation, it gives off some poisonous gases. But that is not the only threat — some of the gases undergo changes in the atmosphere to form acids that can destroy crops and natural environments.

Transportation also causes noise pollution. The roar of jet engines can be dangerous to our ears.

Crude oil takes millions of years to form. At the rate we are currently using fuel, we're going to use all there is in a few short decades. One way to save gasoline is to not use it at such a high rate. Carpools, public transit, nonfuel dependent transportation, and well-planned trips all help save gasoline.

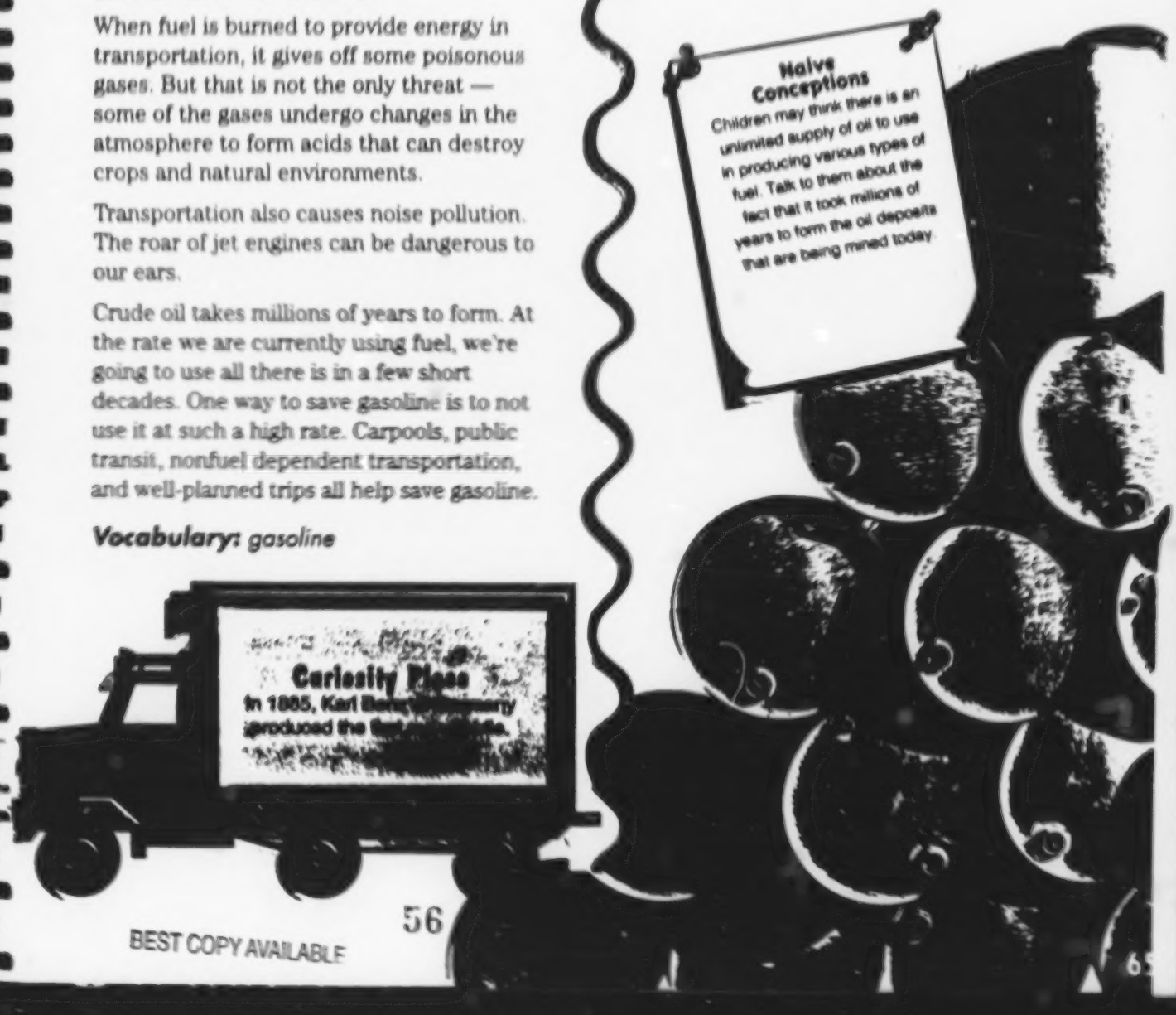
Vocabulary: *gasoline*

Theme Connection: Systems and Interactions

Just as systems of waste disposal such as incineration and landfills contaminate the air and harm the ecosystem, technological systems for transportation also create problems such as air pollution and depletion of natural resources.

Naive Conceptions

Children may think there is an unlimited supply of oil to use in producing various types of fuel. Talk to them about the fact that it took millions of years to form the oil deposits that are being mined today.



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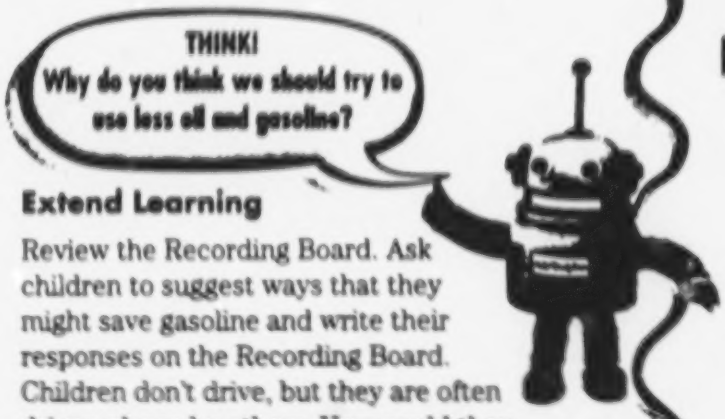
What did we learn?

3

The class has made a list of some of the problems associated with transportation methods. Also ask them to think about how the fuel they use gets transported. Can they think of any problems that people might have in getting oil? If available, you might show children a photograph of the effects of an oil spill.



Extend Learning

Review the Recording Board. Ask children to suggest ways that they might save gasoline and write their responses on the Recording Board. Children don't drive, but they are often driven places by others. How could they help limit the number of car trips that they take? Are there ways they could travel without getting in the car? (by walking, riding a bike, taking a bus)

This would be a good time to distribute Science ThinkMat 15.

Thinking Skills:

Recognizing the Main Idea and Supporting Details; Applying Information to New Situations

Did it stick?

Assessing Performance

PROCESS ASSESSMENT

As you discuss with children the problems with transportation systems, observe whether they seem to understand the reasons for these problems (more cars create more pollution; vehicles and the fuel they use cause forms of pollution). Do they formulate suggestions for ways to save fuel and for alternative means of transportation?

Options

BUILD A MODEL OF A CITY
MORE SCIENCE

Using a large piece of brown paper, lay out a model community. (Use your local area as a basis for the area.) Milk cartons and juice boxes can be used for apartment buildings and houses; shoe boxes for warehouses, manufacturing plants, and other large structures. Children can make cardboard cars, trucks, and trains, and place them on a series of roads and tracks that they have drawn on the brown paper. As they play with these vehicles, have them observe and discuss problems associated with transportation.

GO UNDERGROUND
INTEGRATING LITERATURE

Read and discuss *Underground* by David Macaulay, which takes the reader on a tour of the systems, including transportation, that support a modern city below street level.

16

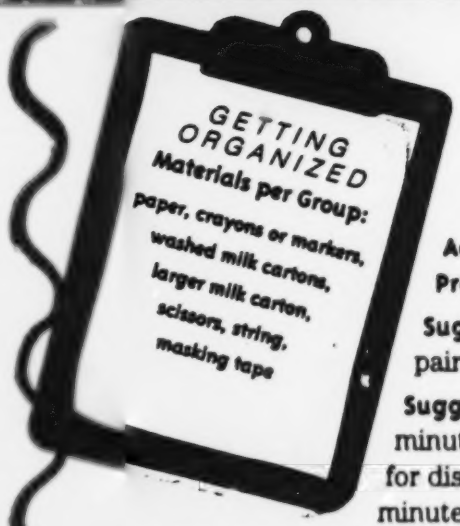
Big Book Pages 28-29

How Can We Solve Some Transportation Problems?

In the last lesson: Children discussed some of the problems caused by transportation systems.

In this lesson: Children build cars and a bus, then compare the two methods of transportation problems.

In the next lesson: Children review methods of transporting people and objects and make a class mural or collage.

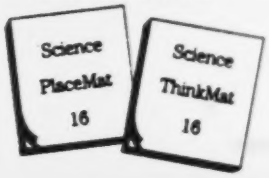


Advance Preparation: none

Suggested Grouping: pairs

Suggested Time: 5 minutes introductory for discussion; 25 minutes for doing the activity; 10 minutes follow-up for discussion and conclusions

Also for this lesson:



Software Option

The Story Line

Grade Level Concept

People need to move living and nonliving things from place to place, and have invented ways to do this.

Subconcepts

People move things via land using various forms of energy.

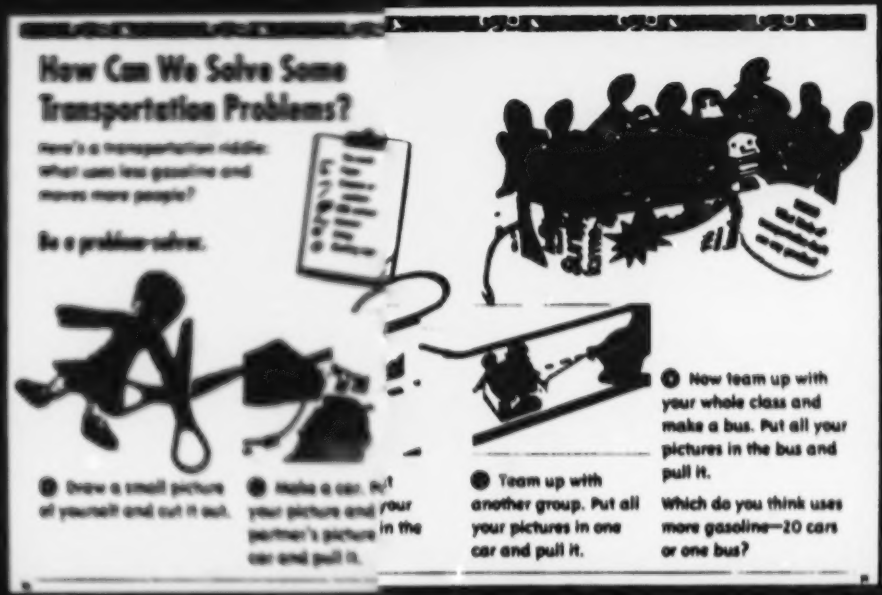
People move things via water and air using various forms of energy.

Solving transportation problems has caused new problems that people are working to solve.

Lesson Concept

Public transportation and carpools can reduce some of the problems associated with transport vehicles.

Pages 28-29


How Can We Solve Some Transportation Problems?
Here's a transportation riddle: What uses less gasoline and moves more people?
Be a problem-solver.
1 Draw a small picture of yourself and cut it out.
2 Make a car. Put your picture and your partner's picture in the car and pull it.
3 Team up with another group. Put all your pictures in one car and pull it.
4 Now team up with your whole class and make a bus. Put all your pictures in the bus and pull it.
Which do you think uses more gasoline—20 cars or one bus?

Theme: Systems and Interactions

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What do we know? What do we want to know?

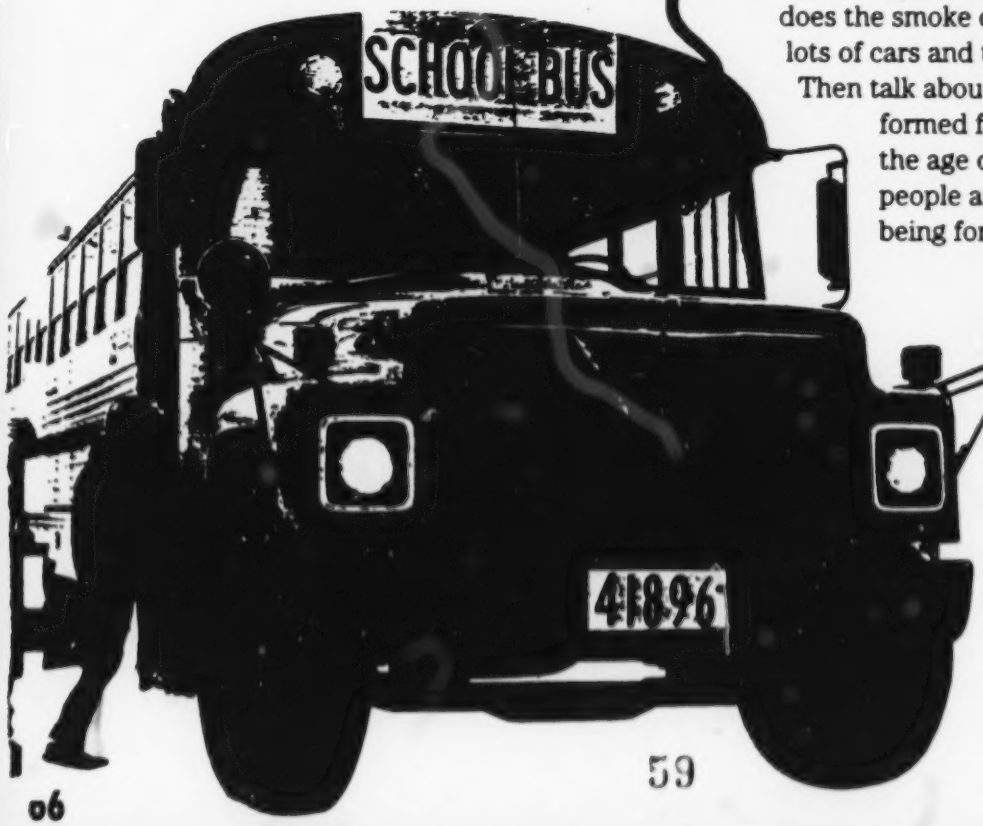
1

Activate

Ask children to help you make a list of places they go. Have them name places close by and some far away (school, a store or movie theater, the home of a relative who lives in another town or state). Ask them what form of transportation they used to get there. Write the responses to these questions on the Recording Board. Then talk about how different vehicles are powered. Write these responses on the chalkboard also.

Considering Second-Language Learners

Restate the main point of the Big Book page in simple language while using visual clues to make your language comprehensible.



How do we find out?

2

Explore

Read through the lesson on pages 26 and 27 of the Big Book to begin a discussion of some problems associated with transportation systems. What kinds of transportation are being used in the first picture? What happens when there are a lot of cars and trucks? Make a list on the Recording Board of problems that children suggest about cars. Ask them what kind of transportation is being used in the second picture. What problems can they see there? Why does the air traffic director need to protect her ears? Are other kinds of transportation noisy? Ask children if any of them live near a busy road or street. What kinds of sounds do they hear? Write these responses on the Recording Board also. Look at the final illustration of the truck producing exhaust smoke.What problems does the smoke cause? What happens when lots of cars and trucks produce smoke? Then talk about the fact that oil was formed from plants that grew during the age of the dinosaurs, and that people are using oil faster than it is being formed.

Ask children to think of other kinds of problems that may be related to transportation. What happens when someone decides to build a road in a certain area? Suppose that you lived there—what would your family have to do? Let them explore the question.

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Content Background

We must find ways to move people and things using less fuel.

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Using buses is one example of alternatives to travel by car. Because a bus can hold more passengers than a car, it can move a greater number of people from one location to another. If 50 people who each drove a car were to take the bus instead, there would be 50 fewer cars on the road and less fuel would be used.

Theme Connection: Systems and Interactions

Moving a group of people in one vehicle can save fuel. As this lesson shows, people have devised systems such as using buses for transporting large numbers of people. Nature's systems sometimes exhibit the same kind of efficiency. Seeds inside seed pods eventually travel to new locations, often resulting in a new group of plants in those locations.

Curiosity Place

Camille Genatsy, from Belgium, invented an electric car that could go up to 65 m.p.h. in 1899!

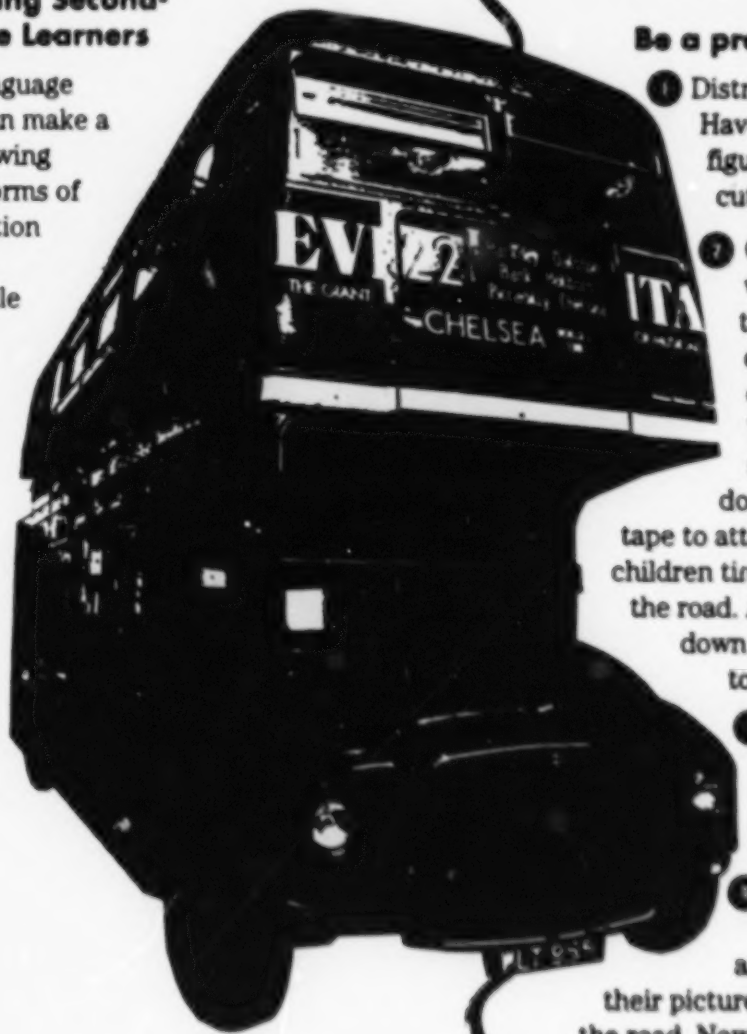
What do we know? What do we want to know?

1 Activate

Read the introductory question on page 28 of the Big Book and have children think of ways to move more people while using less gasoline. (They may think of such things as ferries, subways, buses, vans, station wagons, or airplanes.)

Considering Second-Language Learners

Second-language learners can make a poster showing different forms of transportation that move many people at once, such as ocean liners, double-decker and regular buses, and jet planes.



How do we find out?

2 Explore

Read through the Big Book activity on pages 28–29. Children's cars will travel a road that goes from a parking lot on one side of the room to a circus tent on the other. In both places, mark off a square with masking tape. Then mark the road with masking tape.

Be a problem-solver.

1. Distribute Science PlaceMat 16. Have children draw small, full-figure drawings of themselves and cut them out.
2. Children should lay each washed milk carton on its side, then cut off top half to make a car. Attach string or cord to cars so children can pull them. Tell them to fold their figures so they look like they're sitting down, and use rolled masking tape to attach pictures to cars. Give children time to pull their vehicles down the road. Ask them to take as many trips down the road as they need in order to move the whole class.
3. Have pairs team up and repeat the activity, this time moving four riders in each car.
4. Have children construct a bus out of the larger carton and have all the children tape their pictures to the bus and pull it along the road. Now how many trips does it take to move the class?

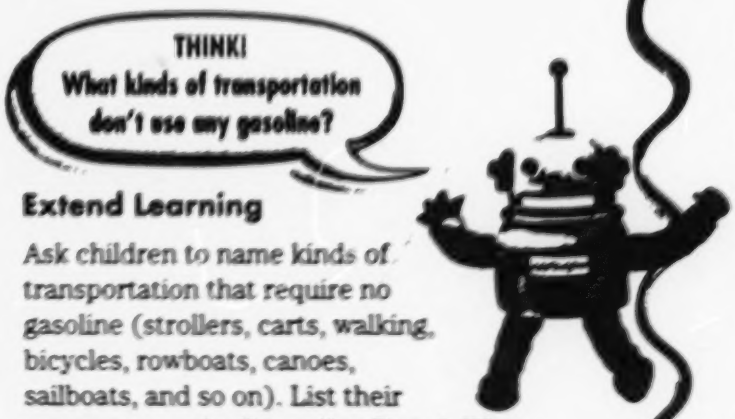
Process Skills:

Observing; Comparing; Communicating

What did we learn?

3 Apply

Ask children to compare transporting the class in cars and in a bus. How does using one vehicle to move the entire class affect energy consumption? Was it more work to take one trip or to take several? What's one good answer to the transportation riddle? (They may suggest solar automobiles or fewer cars and more buses.) What uses less fuel, ten cars or one bus? What makes less traffic? What are the streets with the most traffic in your neighborhood? Why are there so many cars? What could people do to solve the traffic problem?



Extend Learning

Ask children to name kinds of transportation that require no gasoline (strollers, carts, walking, bicycles, rowboats, canoes, sailboats, and so on). List their responses on the Recording Board. What kinds of transportation don't require vehicles? (running, walking, carrying items in backpacks)

This would be a good time to distribute Science ThinkMat 16.

Thinking Skills:

Making Physical Models; Drawing Conclusions

Did it stick?

Assessing Performance

PROCESS ASSESSMENT

After completing the activity, children's responses to questions should reflect an understanding that buses burn less gasoline and create less traffic in moving a group of people from one place to another.

Options

HOW MANY PEOPLE CAN YOU FIT?

MORE SCIENCE

Use shoe boxes and experiment with trying to fit comfortably as many people as possible into your shoe box train car. Make people of oak tag and bend them at their feet to stand in the vehicle. String the shoe boxes together and make an engine to pull them all.

TRAFFIC JAM!

INTEGRATING DRAMATIC ARTS

Have children role-play being in cars that are stuck in a traffic jam. Put several children in one car and have several cars full. What are problems with being stuck in traffic? How do children and adults feel when they are stuck, late, breathing pollution, and hungry? Would it be easier to be stuck by yourself or with someone else? Why? Also, try role-playing being in a bus that is not stuck.

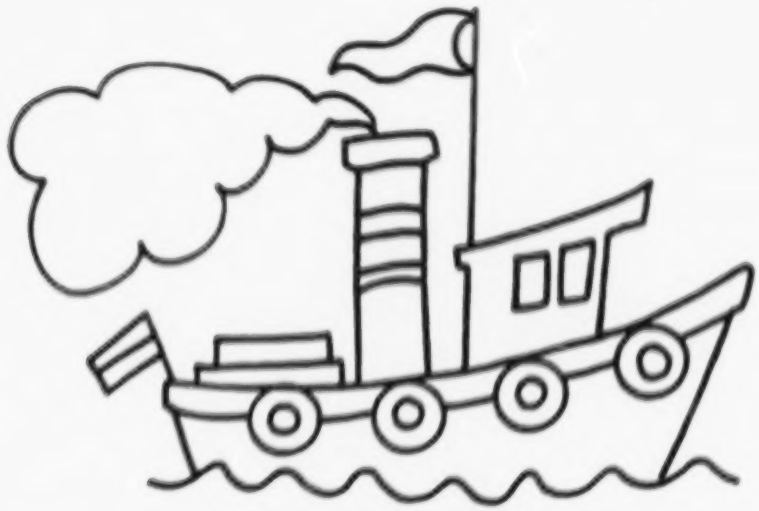
How Can Boats Move Without Sails?

Objective: A paddle makes energy which makes a boat move.

Materials:
Cardboard or milk carton cut into 4 in. squares
Rubber bands
Scissors
Large pan of water at least 4 in deep.
Ruler

Procedure:

- Cut one side of the square into a point.
- Cut out a 2 in. square from the opposite end.
- Cut a 1" x2" paddle from the cardboard or milk carton.
- Loop the rubber band over the ends of the boat.
- Insert the paddle between the sides of the rubber band.
- Turn the paddle toward you to wind the rubber band.
- Place the boat in the container of water and let go.
- What happens?
- Turn the paddle away from you to wind the rubber band.
- Place the boat in the container of water and let go.
- What happens?



How Does Wind Affect Boats?

Objective: The amount of wind affects a sailboat.

Materials:

Modeling clay	Ruler
Toothpicks	Construction paper, 1-1/2"x2"
Scissors	Walnut shell halves
Pencil	Large pan of water

Procedure:

- Thread the toothpick through the paper like a sail.
- Fill the walnut hell with clay.
- Place the toothpick in the clay, making sure the sail is above the walnut.
- Make sure the boat is balanced.
- Place the boat in the water.
- Blow on the sails.
- Blow gently. What happens?
- Blow hard. What happens?
- Can you tip over the boat?

What is a House?

Objective: Students will learn that *every thing* has a house or is a house for something *else.*

Materials: Book: A House is a House for Me by Mary Ann Hoberman
Poster Board of House with words printed on it reading "A _____is a house for a _____".
White construction paper cut 6x6- 2 sheets per student
2 loose-leaf rings

Procedure:

1. Read the story A House is a House for Me.
2. Discuss the story and have children discuss favorite parts, etc.
3. Ask the children to think of an object and its house. Tell them to think of a few favorites to avoid repetition.
4. Give each child 2 sheets of paper. On one sheet write (or have child write)the object and on the other write the house.
5. Place the finished product on loose-leaf rings. The objects all on one and the houses on the other.
6. Hang the rings in the blank spot of your poster so that it reads "A (card) is a house for a (card).
7. Place the poster in an accessable area where children can create funny sentences or fix them to be correct.

Where do I live?

Objective: Students will learn the differences and similarities between a house, apartment, condo, or duplex.

Materials:
Pictures of various types of houses
A small milk carton for each child
Construction paper cut to fit around the circumference of each milk carton in various colors for houses.
Construction paper cut to fit roof of house for milk carton.
Scraps to use for doors, windows, etc.
scissors
glue

Procedure:

1. Look at pictures of various houses and discuss similarities and differences.
2. Have children talk about their home.
3. Give a milk carton to each child and tell them to make their home using the appropriate colors.

Wheels

4 wheels on Daddy's car,
3 on sister's trike,
2 on brother's motorcycle,
And 2 on my new bike.

Skyscraper

Skyscraper, skyscraper,
Scrape me some sky;
Tickle the sun
While the stars go by.

Tickle the stars
While the sun's climbing high,
Then skyscraper, skyscraper
Scrape me some sky.

Homemade Boat

This boat that we just built is just fine-
And don't try to tell us it's not.
The sides and the back are divine--
It's the bottom I guess we forgot.

-Shel Silverstein

Tree House

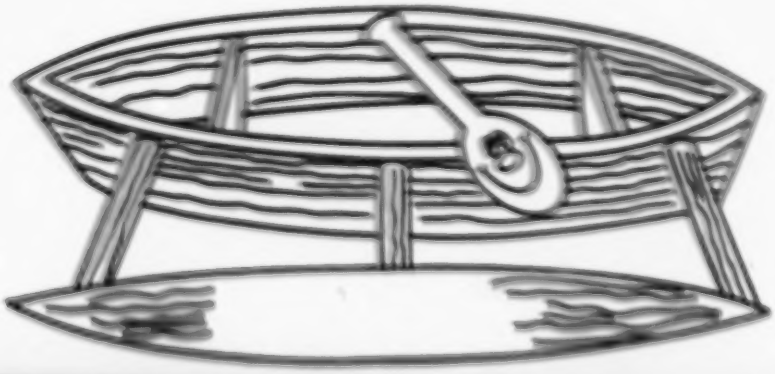
A tree house, a free house,
A secret you and me house,
A high up in the leafy branches,
Cozy as can be house.

A street house, a neat house,
Be sure and wipe your feet house
Is not my kind of house at all--
Let's go live in a tree house.

-Shel Silverstein

My Little Red Fiat

My little red Fiat needs more gas
How many dollars do you ask?
One, two, three,
That's enough for me.
Clean the windshield.
Check the oil.
I'll be home
In a very short while.



Songs

I see red cars,
I see red cars,
On the street,
On the street,
Honking, rolling, speeding,
Honking, rolling, speeding,
All day long,
All day long.

-sung to Frère Jacques

I'm a little airplane
Up in the sky.
These are my wings.
They help me fly.
When I get excited,
Then I shout.
Come soar with me,
But don't fall out!

-sung to "I'm a Little Teapot"

Safety Song

Red means stop and green means go.
Yellow's caution, we all know.
We'll pretend that we're cars too.
Red means stop and green means go.
Yellow's caution, we all know.

-sung to: Twinkle, Twinkle Little Star

Buckle Up

When I get into the car,
I buckle up for near or far.
It holds me in my seat so tight
I feel so safe, I know it's right.
I use my seatbelt every day.
So I'll be safe in every way.

-sung to: Twinkle, Twinkle Little Star

Community Helpers Song

Mailmen deliver mail,
Nurses help us when we're sick,
Bankers deposit money,
Farmers raise cows, goats and chicks.

Doctors, teachers and police,
We all need them so.
Each does his important part--
Always on the go.

Bus drivers, sales and firemen,
Couldn't do without them too!
Can't wait 'til you grow up,
There's so many jobs for you!

-sung to: Rudolph the Red-Nosed Reindeer

Jimmy Jones Built a Car

_____ _____ built a car
E I E I O
And on this car he put some _____
E I E I O
With a _____ here and a _____ there
Here a _____ there a _____
Everywhere a _____ _____
_____ _____ built a car
E I E I O

-sung to: Old MacDonald Had A Farm